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NEWS IN BRIEF

ICL succeeds
with DHSS

A CONTRACT for four ICL 2950s which could lead to orders for a further 22 has been awarded to ICL by the Department of Health and Social Security. It was won in open tender with many other suppliers and is to automate the processing of Inconcity and supplementary benefits, which at present is done manually.

A twin 2950 development system will be installed in Reading and a pilot trial will begin in Bath in 1981.

RAC automates

MEMBERSHIP, subscriptions, and accounting are among the functions to be handled by a PDP-11/34 being installed by the Royal Automobile Club. The systems are being implemented in Filton by consultants Padel in conjunction with Ace Microsystems.

Council switch

SWITCHING from ICL 1902T to an ICL 2950, Camden Council has become the ninth London borough to install a 2900 range system. The £750,000 machine will be delivered early next year and will then handle online database applications such as housing, finance and social services as well as supporting a network of VDUs.

Turnover doubled

THE Systems Designers group reports a turnover of £2,756,483 for the year ended January 31, more than double the previous year's figure of £1,326,838. Pre-tax profits were £221,574 for the group, which comprises Systems Designers and Systems Production. The NEB has a 28% holding in the company.

\$15m contract

IN A continuation of its business with OEM printer specialist Dataproducts Corp, Burroughs has placed a \$15 million contract for microprocessor driven 320 and 650 1pm printers.

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Coming of 'people amplifiers'

BY the mid-1980s, technology will have evolved sufficiently for a complete computer to be fabricated as a single component, and devices known as "people amplifiers" to be produced, according to Earl Joseph, Univac futurist.

Speaking at a conference in the South of France last week, Joseph said such "futuristic forecasts" were strict extrapolations of current computer trends and as such were not predictions.

Taking that as his base, he explained that a people amplifier appliance would provide an in-

dividual with any information or training he required.

"I see technology producing the library, school, or office on a chip," said Joseph. "Quite soon computers will be reduced to a nut and bolt status. This will happen because it is uneconomic to produce small numbers of a particular machine as we do now. In the future, millions, if not billions of copies of a design will be made and they will find their way into every part of our lives."

One novel example he added, was that of the microfactory on a chip, which could be seen in the early 80s.

"Instead of a farmer giving over the whole of his land to one or two crops and then selling his produce at a market, he could, in the future, use the microfactory to plant, propagate, harvest, and process whatever he likes."

Turning to another area, Joseph projected computer trends over the next decade.

In terms of automobiles, it would be possible to devise vehicles with automatic collision avoidance systems that would need no operators or drivers and have little need for maintenance.



Joseph

Partners fall out over
future policy of CII-HB

THE French government and the other major French shareholders in CII-Honeywell Bull, CGE, are in disagreement about the future direction of the company.

Another big industrial company, St Gobain-Pont-à-Mousson, is keen to take a substantial shareholding, and the disagreement should improve its prospects (CW, July 5).

CGE has issued a statement rejecting a request from the French government, but neither CGE nor the industry Ministry will divulge details of the request.

The statement starts by noting that CII-HB's financial and technical performance since it was formed in 1976 has been satisfactory and in line with the company plan which CGE in-

itiated and helped to frame. It then goes on, "CGE has noted the new arrangements envisaged by the government for the development of CII-HB, and the conditions under which CGE is being asked to assume responsibility for this development vis-à-vis the State. After close study of these arrangements, the board of CGE has decided that it must decline."

Without knowing the original request, it is impossible to be certain just what it is that CGE is rejecting. It could be that the electrical and electronic giant objects to CII-HB moving into markets such as office automation and banking which would bring it into direct conflict with CGE subsidiaries such as Trinitrac and Sintra.

If this is the case, CGE may well want to retain and even increase its shareholding to try to influence CII-HB's expansion plans. Another possibility is that the government wants CGE to turn over its small systems and terminals companies to CII-HB.

A third possibility is that CGE is now prepared to sell all or part of its stake in Compagnie des Machines Bull, the holding company for the French share in CII-HB. If so, St Gobain is ready to buy.

Compagnie des Machines Bull holds 53% of the shares in CII-HB and Honeywell has the remainder. CGE and the French government each holds 20% of Machines Bull, and the remaining 60% is held by small investors.

Pascal compiler validating package

AN extensive suite of programs for validating Pascal compilers is being distributed by the National Physical Laboratory. Consisting of 263 separate programs, the package is compatible with the US Navy's Cobol validation suite and is intended particularly to help implementers anxious to conform to the current ISO draft standard for Pascal. According to Brian Wichman, co-author of the suite with Arthur

Sale of Tasmanian University, most current compilers are unlikely to perform well on the tests. Few have yet been brought in line with the ISO draft and many language facilities were previously defined imprecisely.

Copies of the suite can be obtained from the NPL for a single handling charge, likely to be about £5 for those supplying their own tapes and £10 for others.

PO strikers ready to go it alone

STRIKING Post Office computer staff are expected to reject the latest pay offer, and switch from official to unofficial action, if the ballot of the 45,000 Post Office members of the Society of Civil and Public Servants is in favour of the offer.

Computer staff believe the offer (CW, July 26), worth between 18.5% and 19%, does not give them parity with Post Office engineers.

An SCPS spokesman said, "Because of this situation, we are seeing a very rapid turnover of staff, and if just two more

people working on telephone billing using the Loo 320s leave, there will be nobody experienced enough to keep that operation going. It is not just pay, however; it is also the lack of a viable career path."

The SCPS computer staff may be supported in their unofficial action by computer staff members of the Civil and Public Servants Association and some stores control staff.

Bank offer doubled

THE threat of strike action by computer staff at the five main clearing banks (CW, July 18) has now been removed following a revised pay offer. The five banks

have more than doubled their original offer of 8.5% to between 17.5% and 18.5% plus an annual bonus of 2.5% backdated to July 1. Only one day of strike action took place during the dispute which has been handled by the banking union BIFU.

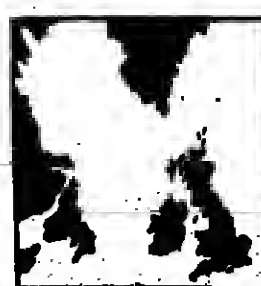
Pension pressure

NCR workers at Dundee who have been staging an overtime ban in a bid to win better pension terms have threatened strike action when they return from holiday this month. It is believed that they will receive support from NCR field engineers.

Announcement on split soon

IN the annual report of the Post Office Corp, the chairman, Sir William Barlow, reaffirms support for the Carter Committee proposal favouring a split between postal and telecommunication operations. The report showed telecommunications had a record surplus last year of £347.1 million (up 6.3 per cent) on an income of £3,243.9 million (up 10.9 per cent).

In the Commons last week Industry Secretary Sir Keith Joseph said that he found the Carter case for a split compelling and was moving towards a conclusion on the issue.



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Bangkok
Bank orders
Magnusons

WHAT is believed to be the first order for IBM compatible Magnuson M80 mainframes outside North America has been placed by the Bangkok Bank in Thailand. The order was placed with Magnuson ATC, the UK based agency that covers Europe, the Middle East and Far East.

The machines on order are two M80 Model 43 machines, the 43 being the biggest processor currently offered by Magnuson. It provides 30% more power than the IBM 4341 and, according to Magnuson ATC, the Bangkok Bank selected 43s in preference to two IBM 3031s. The bank currently operates two 370/15s.

One Model 43 will be delivered to Bangkok in late September and the second machine will be installed next year. By then the machines will be field supported by their full powers.

At the moment M80s being ordered are older, less powerful models because Magnuson is holding off finishing off specifications of the Model 43 and 43, which both exceed the 4341, until delivery of a IBM machine next year (CW, April 26).

Magnuson ATC said it is sending a system specialist to Bangkok to liaise there permanently. It has been agreed that the specialist will be based in Bangkok and will be supported by ITS, a subsidiary of the international data network company.

Magnuson ATC was set up last year to sell M80s to the air transport industry but is dealing with the IBM community in general because of the level of demand (CW, July 5).

Briefing
3033 an H
series model?

WITH the likelihood that IBM will replace the 3032 with a cut-down version of the 3033 (CW, July 19) US observers are seriously considering the possibility that far from being a stop-gap machine with a short life, the 3033 could be an embryo H-series model.

They say that several unused sockets in the 3033 processor could be there to accept plug-in modules to make up the distributed function architecture expected in the H-series. If this were the case, the performance of the 3033 would probably be enhanced to make it the H2 model, with the cut-down version becoming H1.

BCS grades

PROPOSALS to simplify the grading structure of the British Computer Society have been accepted by its council (CW, July 19) and are to be submitted for approval by the membership at its annual meeting on October 12. Under the new plan, there will be three professional grades of membership. Licentiate is being merged into the Associate grade.

Help for blind

THE year-long evaluation of a Kurzweil Reading Machine for the blind (CW, March 30, 1978) is to be carried out at St Dunstons, London in conjunction with the Royal National Institute for the Blind. The two institutes have jointly bought for £10,000 one of the first production models of the US machine and intend to train blind people to use it.

PD offer rejected

THE Post Office offer to staff in the Society of Public and Civil Servants has been rejected (CW, August 2) and the strike, which has been holding up the processing of telephone bills, is to continue. The SPSCS is seeking more than the 18% proposed and also wants a firm commitment on career paths and regrading.

Report for DPP

POLICE report has been sent to the Director of Public Prosecutions about alleged financial irregularities at the Plessey telecommunications plant at Edge Lane, Liverpool. It has alleged that government contracts in the plant, which is a centre of System X development, have been misappropriated.

Name change

THE parent company of Univac, Cherry Rand Corp, formally changed its name to Sperry Corp at the annual shareholders meeting last week.

ICL TP monitor

ICL Datasilk is reported to have launched a VME/B TP monitor called Dars, which, although similar to ICL's TP Option, is tailored to particular application requirements.

CW Ball will raise funds for Braille unit

FUNDS to support the purchase of a portable unit which can provide word processing and Braille notation facilities, will be raised at this year's Computer Weekly Ball. An important feature of the equipment, the VersaBraille, is that Braille notation can be taken silently, enabling a student to take notes during lectures. At the same time an audio recording of the lecture can be taken.

The VersaBraille, which weighs about eight pounds, incorporates a standard V24 interface and can be linked to any mainframe to retrieve data. It is also possible to

recall information from local memory and from cassettes.

Braille is input by means of a keypad and the operator can check on the stored information with a Braille notation readout which uses moveable pins to present 10 characters at a time.

It is planned to place the first unit on permanent loan at Hatfield Polytechnic where a blind computer science student, Anne Telford, has just successfully completed her first year.

Cost of a VersaBraille unit is £3,500 and it is intended to raise the bulk of this at the

Computer Weekly Ball, with an appeal to companies in the computer industry to donate the balance.

The year's Ball, which is once again under the patronage of the British Computer Society, will be held at the Royal Lancaster Hotel, Lancaster Gate, London, on Friday, October 12. Tickets cost £17 each and include dinner, cabaret and dancing until 2 am. Companies wishing to book complete tables for 10 or 12 people should contact Chris Hipwell, Room 125, Dorset House, Stamford Street, London SE1 8LU. See application form on page 6.

ICL at
risk in
Nigeria

AMONG the British investment at risk in Nigeria following the nationalisation of BP's interests there, is the small but fast-growing ICL company.

Velled hints from Nigeria's delegate to the Commonwealth conference, Major-General Henry Adeniji, that Nigeria had "more tricks up its sleeve" if the move against BP did not have the desired effect, convinced observers that other British companies are in line for nationalisation. ICL's business in South Africa would make it a prime target.

ICL Nigeria is fairly large by Third World standards. It employs 92 people and is already 40% Nigerian-owned. ICL has sold shares in the company to local interests during the past 12 months to meet the requirements of the Nigerian Enterprises Promotion Decree.

ICL had no comment on the possibility of nationalisation and was unable to say how many of its machines were installed in Nigeria, but last month it announced a £1 million order for two 2904s from the Nigerian National Petroleum Corp (CWN, July 19).



The merger move was foreboded by Dr Gene Amdahl in a CW interview in 1977 (December 9). "If there were a shortage of competitive peripheral companies, we might have to make an acquisition," he said.

Amdahl, Memorex in
merger talks

MERGER talks are under way between Amdahl Corp and peripheral specialist Memorex to create the fiercest competitor IBM has yet faced in the large systems market. If the talks prove successful, Amdahl would take over Memorex by issuing 1.2 Amdahl shares for each Memorex share. With about 8 million Amdahl and about 17 million Memorex shares on issue, this would leave Amdahl stockholders with almost 64% of the new Amdahl-Memorex company. Initial market reaction was that the proposed share exchange seriously undervalued Memorex.

Fujitsu of Japan, which supplies components and assemblies to Amdahl, and tape drives and some disc drives to Memorex, has about 27% of Amdahl at present, and warrants which can be exercised at any time to bring its holding up to 32%. If the warrants are not

exercised, Fujitsu's holding in the merged company would be just over 17%.

For the first half of 1979, Amdahl had turnover of \$144 million and Memorex \$359.2 million. Assuming that each company does at least as well in the second half, the merged company would have a turnover of just over \$1,000 million.

This would place it just behind Digital Equipment Corp, CII-HB of France and Britain's ICL in the league of major computer systems companies.

Amdahl has hitherto specialised in large-scale general purpose IBM compatible CPUs covering the 370/158 to beyond the 3033. Memorex manufactures and markets IBM-compatible disc drives, tape drives and 3270-type terminals. It also makes a communications processor alternative to the IBM 3705, and magnetic media.

The merger would take

Memorex into the mainframe business for the second time. In a disastrous venture, which nearly wrecked the company, Memorex pioneered the manufacture and marketing of IBM-compatible processors with its MRX 30 and 40 in the early 1970s.

Memorex is Amdahl's second choice as partner. The company discussed a similar arrangement

● Turn to back page

IBM year late with System 38

IN what should prove a windfall for its competitors, notably ICL, IBM has run into serious problems on the System 38 database computer for small business applications and will not now begin first shipments until mid-1980, almost a year late.

The reason given is that more time is needed to integrate and test the advanced programming technology in System 38 to meet planned performance levels.

The problems present a golden opportunity for ICL to capitalise on IBM's misfortunes with the new 2905, not only in the UK but particularly on the Continent, where IBM has a much bigger System 3 base.

The 290X series has been consistently successful in the System 3 market, at which the Sys-

tem 38 is targeted, and the 2905 uses the proven hardware of the 2950, and features an improved operating system and both the full and the easy-to-use versions of the IDMS database management system.

Hash Wiener writes from New York: The reason for the delay is

that IBM has found that the complex operating system on System 38 requires many more instructions than had been intended. The new 64K-bit chip is used in the System 38 control store and because it is a compa-

● Turn to back page

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CONTENTS

Computerworld on privacy	2
Focus on miniaturisation	3
Pay or use software	4
Downside by Chad	4
Letters to the Editor	4
\$1,000m profit for IBM	8
Michie on a spouse story	8
Programmer Notes	7
Powerful File	7
Powerful File	7
On Spot on the job market	8
Micro News	12
People and Events	12
Irish tax advantage	13
Interpretation of Personal	16
Comments in Berlin	16
Personal as fingerprint	17
Amdahl's secure future	17
Stiles and Marketing	18

JOB VACANCIES
PAGES 19-27

April 1979

Downtime

by Chad

Foot slog-1

IF you think your efforts in computing are going unappreciated by the general public, take a look at this letter that appeared in the Eastern Evening News, Norwich:

I think £8 million for a weather forecast computer is utterly scandalous when there are so many serious diseases that have to rely on voluntary gifts just for research purposes. . . . There are surely enough people with corns and bunions which do the job of weather reports just as well and are cheap. (Mrs) D. LANE

Foot slog-2

HERE'S dedication for you. A teacher from Horwich, near Bolton, is going on a one-nun sponsored walk from Land's End to John O'Groats to raise the money to buy a micro-computer for St Joseph's RC School where he teaches. John Deady is his name, and all I can say is, more power to your blistered feet, John. I'm sure my employers would be delighted if I went on a sponsored walk to raise money for a new typewriter. Still, teaching in these days of flailing Chancellor's axes calls for an extra special vocation.



"We'll just leave them to negotiate while we slip out for a pint."

Graffito

HO hum. It's the conference season again, and as I sit through lecture after lecture I ponder on how few are original, stimulating, and non-obvious, and how many are none of these. It brings to mind that graffito that I understand (second-hand) to be seen on the walls of more and more high-class ladies' loos, and that I am beginning to think is a very apt motto for the late Seventies. "You have to kiss an awful lot of frogs to find one prince."

LETTERS TO THE EDITOR

Prestel leads the world by the nose

IT was good to hear from David Butler, in his letter to you (Letters, July 12), that France and the UK are becoming the laughing stock of the viewdata world. We have always felt that there was not enough laughter in computer services, and fun is one of the secret ingredients in Prestel's success — witness more than 100 games, jokes and puzzles already on the system.

But seriously, while I can understand David Butler's desire for a grand Anglo-French alliance to develop and market viewdata on a worldwide basis, I do think he is on the wrong tack. Viewdata is one of a long and distinguished series of brilliant technical inventions that have been produced in this country. Too often in the past such inventions have languished for lack of energetic commercial exploitation, and have had to go overseas to be properly appreciated. The Post Office is determined that this shall not happen to viewdata.

This country has the skills, resources, and imagination to exploit viewdata effectively,

provided that the project is pushed forward now, in a bold and enterprising spirit. This we are doing. We are years ahead of the rest of the world, and have already sold our technology to West Germany, the Netherlands, Switzerland, and the US. We have created, in Prestel, a whole new industry in the UK, providing business for hundreds of firms, including, I am glad to say, Butler Cox and Partners.

Of course we must move towards common technical standards for the various national viewdata services. And we are working intensively not only with the French, but with many other countries, towards this end. But the task is not as simple as David Butler suggests. In the early days of a new service there will be room for different, and genuinely held, points of view on the right technical solution.

And since Prestel, Ceefax and Oracle have become firmly established as going commercial services, we must obviously seek to achieve international standards which are "downward compatible" with these existing services. International com-

tees exist to resolve these problems, and they are doing so.

But please don't suggest that Prestel should become bogged down in grand inter-governmental ventures. It would be the kiss of death. We have moved from the decision to proceed with Prestel (February 1978) to the opening of an admittedly limited public service (March 1979) in about three times the speed of inter-governmental projects such as Europe. And grand inter-governmental ventures have a nasty habit of losing touch with the marketplace (cf Concorde).

Prestel is an example of Britain leading the world, not only in invention, but also in commercial exploitation. If the Americans David Butler meets find this funny, they must have a peculiar sense of humour. The Americans I meet are amazed (and frankly a bit embarrassed) to find poor old Britain leading them by the nose into the information society.

Dr ALEX REID
Director of Prestel
London.

NCC and the Filetab story

FROM 1968-1972 I led the NCC team which specified and produced the Filetab system and I must put the record straight regarding the development of this package, for I fear J. E. C. Cartwright's memory is at fault (Letters, July 5).

Filetab is based on the NITA package which was designed, written and sold by Tom Barnard in 1968-69 and which is still in use alongside FILET. Because of a mutual interest in the use of Decision Tables as a programming language, when Tom

joined me at NCC early in 1968 he and I specified the Filetab system and persuaded NCC to enter the field of software production, a decision which has been beneficial to the computing community and NCC.

Once it was successfully established, many people have claimed some involvement in the design of Filetab. Certainly, in the later 1960s Bob Johnson and his team at E. A. and S. Robinson in Bristol produced a specification for a parameter-driven reporting package. How-

ever, Filetab was already available and being sold for ICL 1800 machines and Bob contacted me at NCC when he learned that a version was being developed for the IBM 360 series.

Because we could not give priority to Robinson's requirements, Bob commissioned a software house to produce a tailor-made package. I wonder what happened to it?

Mrs M. PHILLIPS
Warrington, Cheshire.

Amateurs seek computer site

THE Southampton Amateur Computer Club has been offered an IBM 360/40 and we have accepted the offer. The computer is now in storage, as we are not yet able to run it due to lack of a suitable site. We need a large building, say 20ft x 12ft, with a solid floor and three-phase electricity. The running cost will be much lower, £500, than our earlier estimate of £5,000, and we are hoping that we will be able to raise most

of this cost by charging our members "at cost," and by limited sponsorship.

We are setting up a special sub-committee within our club to investigate further details of the project, with a view to the computer being put to use, apart from members' own projects. The Soton ACC is now just over a year old and we are fairly well known throughout the UK. We are beginning to adapt

more to the needs of our members, and we organise local talks of general interest. We meet on the first Wednesday of each month, restarting in October, at the Medical Sciences building, Bassett Crescent East, University of Southampton, at 7.30pm.

P. D. MADDISON
13 Watford Road,
Portsmouth,
Southampton,
Hants SO2 1HP.

Readers thanked

MAY I, through your columns, thank Computer Weekly and all your readers who responded to our appeal for a Braille online terminal (CW, July 6)? As a result of their help, and also the generous offer of Rolls-Royce at Bristol and the Cambridge University Computing Service, our students will have interactive access next year.

I. R. MACCALLUM
Senior lecturer
Dept of Computer Science
Essex University

Fair comment?

IN "Gill's Mythology" (July 5), Figure 1 contains a sample of a design specification. M.T.X.T. Comments shall be made for at least 30% of source lines.

Would not a more useful specification be M.T.X.T. The source shall be sufficient clarity that comments are necessary on less than 30% of the lines on avg?

Dr A. N. WALKER
Dept of Mathematics,
Nottingham University.

A place for Control Theory

MAY I applaud Tim Gill's description of the way in which he specifies goals for maintainability, and monitors the attainment of these goals? At the same time, I do hope that his readers will realise that this is only one area among many where the specification of goals and monitoring methods would lead to more satisfactory computer systems.

Control Theory has been accepted for decades in many engineering applications, and surely has some use in the "soft" parts of computer systems design. Perhaps one could do a top-down design using a methodology such as Michael Jackson's. For each process on the structure chart, input and output are specified. This is, of course, the desired output, not goal. The final stage would be to decide on methods of monitoring the output to feed out what corrections should be applied.

By "output", I mean, for example, a valid record from a data-set, an updated version of the file, a continuous response to queries on a database, or satisfaction with the computer system. These are at different levels of one top-down hierarchy, viz the theoretical design. Unit systems, and programs, can be looked at according to other types of goal which "maintainability" has.

The major difficulty in this would appear to be the lack of suitable methodologies.

Dr LEXANIC
Lecturer in Computing
Polytechnic of the South Sea
London SE1 8AA.

More help sought for school work

I WOULD like to thank all those who replied to my request for help and advice on computing in schools (Letters, July 5). I have received much useful data on microprocessors and units for use in the school where I teach, and advice on useful publications and organisations. I am very grateful.

I would like to use the columns of Computer Weekly once more. I wish to know sources of two items of equipment suggested to me:

(a) slow, small unit readers capable of being linked to teletype lines, and
(b) a card punch other than the older button type or the 02D keyboard type.

I remember some years ago seeing literature on a punch that could handle one card at a time.

M. G. PAUL HUTCHINGS
79 Lanwood Road,
Whitlock,
Pontypridd,
Mid-Glam CF37 2EP.

YOUR front page article, "ICL clears the way to 2900" (CW, July 19), does not go far enough in stressing the true significance of SME (Simulated Machine Environment).

SME is not merely concerned with such a narrow field as conversion; rather it is about active transition from a 1900 (or DME) to native 2900.

The concept of SME is that of building an image of the VME user interface (hence "Simulated") within a 1900 environment. This means the co-ordination of previously free-standing products, for programs and data conversion, into an integrated environment (VME/BSCL under George 3).

The benefits of this approach are that all new work can be written to 2900 standards in a form which can be run under

decide on methods of monitoring the output to feed out what corrections should be applied.

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Mid-Glam CF37 2EP.

YOUR front page article, "ICL clears the way to 2900" (CW, July 19), does not go far enough in stressing the true significance of SME (Simulated Machine Environment).

SME is not merely concerned with such a narrow field as conversion; rather it is about active transition from a 1900 (or DME) to native 2900.

The concept of SME is that of building an image of the VME user interface (hence "Simulated") within a 1900 environment. This means the co-ordination of previously free-standing products, for programs and data conversion, into an integrated environment (VME/BSCL under George 3).

The benefits of this approach are that all new work can be written to 2900 standards in a form which can be run under

DHSS in moves to automate benefits

THE Camelot project for automating payments of incapacity and supplementary benefits, for which ICL has been awarded the pilot system contract (CW, August 2), is the latest in a long line of attempts by the Department of Health and Social Security to automate these applications.

Incapacity benefit is believed to be the new euphemism for sickness benefit. Attempts to automate such payments were made and discontinued five years ago (CW, August 15, 1974).

Camelot, Computer Aided Mechanisation of Local Office Tasks, is a development of an idea which was being pursued at that time. This involved installing local computers to serve one or more payment offices. The plan now is to put one twin computer system into each of the 12 regions.

The contract was a good one for ICL to win, since it was placed after an open tender in which a large number of companies competed, and indicates that ICL is able to win public sector contracts even without the protection of the single tender policy.

The pilot involves two twin 2950 installations, but if successful it will be applied throughout the 12 DHSS regions, and require a total of 26 2950s, 26 CR80 front end processors from Christian Rosing of Denmark, and 500 7502 cluster terminal systems with a total of 2,500 VDUs.

The pilot project involves installation of one twin 2950 installation in Reading for delivery at the end of the year, and a second, in Bath for the live trial, one year later.

It is planned that the Bath system will serve five local offices equipped with 7502s, but it will have to be able to simulate operation with 226 terminals attached.

The system in Reading will be used for software development. Underlying the venerable ancestry of the project, the operating system to be used is not VME/K but DME. There are

Security worries

WORRIED about security, the US Treasury is taking its payments system, which transfers \$10,000 million weekly to more than 100 government agencies, off a Honeywell 6080 mainframe, and building a dedicated system using a dual Tandem configuration. For added security it is to be installed in a vault.

The Federal Treasury has been concerned for some time that, because of the variety of applications running on the Honeywell machine, it is difficult to control the number of people who could have access to the Treasury Financial Communications System.

Designed for ultra reliable working, the Tandem NonStop 18 computer systems are sold with a minimum of two processors.

Over 200 line up for Computastars finals

THE line-up is now complete for the finals of Computastars to be held at Crystal Palace on Saturday, September 28.

More than 200 computer people will be entering in a variety of both team and individual events, details of which will be released on the day.

Supporters are welcome, and advance tickets cost 80p per adult and 30p per child and can be obtained by filling in the form below. Entrance charges on the day will be 80p and 40p respectively. Teams are:

MEN
East Angles: Thomas Cook, British Steel, Norwich Union and J. H. Minter.

Midlands: Selcon, Data Sciences, Peterborough Data Processing and Thom Electrical.

North East: Camper, Empire Stores, Rowntree Mackintosh, Rowntree Mackintosh II and Rowntree Mackintosh III.

North Thames: CMC, Gordon & Co. Ltd, London Transport and Midland Bank.

North West: Littlewoods.

Management Control Systems, Manweb, Midland Bank (NWCC) and Wetherby.

South Thames: Commercial Union, Easams, Legal & General, National Provincial and London Borough of Lambeth.

South West: EMI, Rank Toshiba and Westland Helicopters.

LADIES
East Angles: Norwich Union, Provident Mutual and Thomas Cook.

Midlands: Data Sciences, Peterborough Data Processing, Thom Electrical and Selcon.

North East: Midland Bank Operations, Provident Management Services, Rowntree Mackintosh I and Rowntree Mackintosh II.

North Thames: Casa, Lola, London Transport I and London Transport II.

North West: British Nuclear Fuels, Liverpool Daily Post and Echo, Midland Bank (NWCC) and Woolworths.

South Thames: Commercial Union, Legal & General I, Legal & General II, London University and Segas.

South West: EMI I, EMI II and Rank Toshiba.

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Racal-Milgo third in survey

UK owned Racal-Milgo ranks third in data by turnover in the Top 50 data communications manufacturers in the UK, according to a survey published by the US magazine Datamation.

If the figure is combined with Racal-Vadic, ranked 18th in the listing with a 1978 turnover of \$12 million, then Racal's 1978 turnover of \$76 million is second only to IBM with \$144 million from data communications. This represents less than one per cent of IBM total turnover on all products.

Banks find \$1,500m credit for IBM

IBM's borrowing requirement has been met by 37 banks only three weeks after the company announced that it was seeking lines of credit totalling \$1,500 million (CW, July 18).

It is the first time for 12 years that IBM has been unable to finance its future business out of its own resources. The company has not said what it needs the money for, but it is thought to be needed for expansion of production facilities for new products, notably the 4300.

There are strong indications

that demand for this is way beyond the company's expectations.

The last product for which IBM seriously underestimated demand was the 3030 series. Following the problems created by that, T. C. Papes, who headed the systems products division which has since been split into two, was transferred to an administrative position.

The men in the hot seats this time round are senior vice-president Paul Rizzo, who heads the data processing products group and, J. D. Kuenler, who is president of the new systems products division, which embraces the 370 series up to the 148, and the 4300 line.

Amdahl link-up

THE job processing system being developed by Brook Street Bureau (CW, July 28) does a Datapoint 5500 for data collection and input to the BOC Data-aid Amdahl 470V/6. The processed information is then fed back to Brook Street where job matching is carried out on Delta Data 4000 terminals, of which eight have been installed so far.

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V1100 DECwriter	96	64	4015-1 ASCII/APL	829	627
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MICHIE'S PRIVATEVIEW

AI comes of age . . .

THE microelectronic revolution is usually perceived in terms of whatever is most immediate — to the neglect of more fundamental implications.

Every radical new technology shows this pattern. The significance of steam power was not first seen only as a cheaper way of pumping water out of mines.

When the age of transportation dawned, the use of the locomotive engine to carry passengers at speed was denounced as medically dangerous.

We even find in Samuel Butler's social fantasia "Erewhon" the new "vapour engines" depicted as taking over the world!

The historian will look back over the early years of machine intelligence. What will he identify as the equivalent to Stephenson's Rocket? Astronomer candidate will be the Mycin program, developed at Stanford Medical School, particularly in its domain-independent Emycin form.

Appropriately, the opening lecture at last month's AISB Summer School on Expert Systems, held in Edinburgh, began with one of Emycin's latest success stories: an Expert System for interpreting tests of lung functions.

The program, Puff, is now in routine use at the Pacific Medical Centre in San Francisco.

The lecturer, Dr Edward Feigenbaum, heads the Heuristic Programming Project which he founded at Stanford University in the mid-1960s. He took his audience on a swing through the successes of 14 years' patient dedication to the new craft of knowledge engineering.

Feigenbaum is uniquely equipped to summarise his emerging principles and his tour of selected case studies set these principles before an appreciative British audience.

The composition of the audience itself marked a new departure. No fewer than 30 of the 100-plus participants came

from industrial and government agencies. Artificial intelligence is entitled to celebrate its coming of age when it can show the capability of earning a living. At Edinburgh, it was abundantly plain that this moment has come.

The first afternoon witnessed a presentation by Ray Cairns, originally one of Feigenbaum's Stanford team, now a member of Lederer's industrial laboratories in New York State.

During a year sandwiched between two appointments, Ray worked in my Edinburgh group to refashion the experimental chemistry program, Congen, into a practical tool.

He was able to report the adoption of his new-style Congen by industrial scientists at Shell's Sittingbourne research centre.

But let us not go overboard about applications. The smell of practical success can have

unsettling effects. At the first whiff of technological benefit, research sponsors show inclinations to argue that basic investigations can now be let go.

The real situation is quite opposite. Never has fundamental inquiry been more acutely needed than when applied successes begin to expose our ignorance of the fundamentals of cognition.

It is from these fundamentals that man-machine consultation systems — if they are to be cheap to make and safe and easy to use — must be structured.

Richard Young, of the Applied Psychology Unit at Cambridge, argued with illustrative variations that the construction of expert systems in the form of pattern-directed rules — now the dominant practical methodology — intimately parallels the cognitive representations of the human expert.

A separate and deep-seated need for basic research arises from the limited nature of Expert Systems as we know them. Knowledge engineering has so far confined itself to the indoctrination of such mental skills as can be completely embodied in pre-stored patterns.

We see this kind of problem-solving in human experts whom age has robbed of the power to innovate and learn. Yet these ancient, hide-bound and blinkered, can still surprise by high performance when confined to familiar ground. Eventually, however, we would like to engineer non-sensitised intelligence!

Steps in such directions were described by Lynn Brutko and Tim Niblett of Edinburgh, who reported on a chess program able to generate new strategies through conjectures and refutations and by Ross Quinlan of Sydney, Australia, who described machine learning in the context of database compression.

The second morning belonged to logic programming, a fad of exclusively European origin destined, in my opinion, eventually to carry all before it.

J. A. Robinson himself, who started it all with his 1965 paper, "A machine-oriented



logic based on the resolution principle," opened with a force which combined sparkling clarity with depth. These and other respects, mirrored his own tutorial masterpiece "Logic, form and function," published a few weeks earlier.

Different incarnations of logic programming in the language Prolog were described respectively by David Warren of Edinburgh, and by Clark and McCabe of Imperial College, London.

Substantial detail will be available in the proceedings of the Summer School to be published later this year. I shall contain for a future column my reactions to the Summer School's second half.

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PROGRAMMER NOTES

Ultimate liability for mistakes

IT is all too easy, when involved with the intricacies of a program, to forget that one's code will ultimately take its place in a demanding and dangerous real world.

There is a temptation, for example, to attach more importance to the program structure and logic than to the numerical results. The former are, after all, the more interesting and challenging aspects of the task.

Yet in the long run it is mistakes in the latter which will be most visible to the user.

In many cases, the incorrect placing of a decimal point will be detected quickly. In some, however, such as an error routine in a flight program, it may not. And the consequences could be very serious.

Similar considerations apply in several other areas, including testing in general and the documentation of program changes.

With the rapid growth of computer applications and increasing dependence on computer systems in general, the potential repercussions of any type of program error must be growing likewise.

But there have as yet been no indications that the ultimate responsibility for a software error could be held at the feet of the programmer — or not in this country at least.

A situation has, however, developed in the US in which a negligent programmer could be held to be criminally liable.

The circumstances under which this could arise are outlined in the latest issue of Computer Law and Tax Report, a newsletter published in Boston as an "intelligence service for computer users and their professional advisers."

Under the headline Can a Programmer Error Create Criminal Liability? the author points to recent regulations

passed by the Food and Drug Administration and ruling the adulteration of drugs: "current good manufacturing practice."

Among the regulations, rules on the use of computers in the manufacture and process of drugs.

They call, for example, for input of formulae and records or data into the computer to be checked for accuracy; for the maintenance of back-up files and hard-duplicates; and for appropriate controls to protect public health and control logs against unauthorized update.

A manufacturer who fails to enforce these procedures will be open to prosecution, notes the newsletter.

So, it argues, will the analyst who ignores these controls or documents his program, or the drug turns out to be adulterated, failure to comply with the checks is evidence of negligence.

In its editorial comment on the one below, and are based on the Exec used on the small 1800. Internally they are collectively known by ICL as Emoe.

No one can deny the enormous success of the 290X line, which took ICL itself by surprise. It turned out to be the right product at the right time, and the success seems to vindicate the choice of operating system.

Nonetheless, it is a predominantly batch operating system, and the demand today is mainly for transaction processing. The 290X represents the same half-way house between the two as IBM's System 34 compared with System 32.

IBM has, however, decreed that the future for System 32 is System 38, designed for transaction processing and database applications.

SOFTWARE FILE

ICL tops out its database range

WITH the release of IDMSX — a facilities-rich enhancement of its 2900 database management system IDMS — ICL is arguing that its data management software is now at least as good as any in the world. The new software, which has been at test sites for a year, becomes generally available with release 5332 of VME/B.

The main intention of IDMSX is to offer users more options, providing several alternative mechanisms where IDMS provided only one or two. It therefore stands in the same relationship to IDMS as IDMS does to IDMS-E, the subset form announced earlier this year (CW, May 31 and June 7).

High on the list of new features is the option to build inverted file structures. The principal file organisation supported by IDMS as Adabas, this option was not previously available in IDMS, which is network-oriented.

IDMSX supports three file inversion mechanisms: standard record-type inversion using logical keys; indexed sets based on pointer arrays; and record chaining, which is most efficient for short sets.

Another IDMSX innovation is a sequential placement mode. Joining the existing random, via set, and direct modes, it has the same characteristics as indexed sequential organisation, offering the chance to optimise for sequential access.

Also addressing DBMS per-

formance is the new ability to hold subsets of a database in virtual storage. Any convenient subdivision of a database can in effect be held in main memory, eliminating the need for disc access to frequently referenced data such as tax tables.

Among other enhancements are further recovery options, aimed mainly at speeding recovery of large databases; the option to set up a temporary file of before-look images; and a number of enhanced utilities.

Nearly all the enhancements stem from requests from the existing IDMS user group, which ICL regards as active and very knowledgeable. There are currently over 130 IDMS users on 2900 and about 50 users of the data dictionary system, DDS — the other main component of ICL's data management offering.

DDS has matured rapidly since its general release two years ago, being seen by both users and ICL as the hub around which DP developments must revolve.

Unlike IDMS, it was implemented by ICL from scratch and it therefore differs considerably from Cullinane's own data dictionary. In its active role, for example, it can generate schemes and record descriptions directly whereas the Cullinane software re-uses the IDMS directory for this function.

DDS uses IDMS as its file handler so that aspects such as recovery — a very strong fea-

ture of IDMS — are incorporated automatically into the dictionary.

The dictionary, which is intended primarily for online use, also benefits from the high performance of IDMS in the 2900 virtual machine environment. IDMS under VME/B is inevitably re-entrant and multi-threaded.

This is in sharp contrast to the equivalent IBM environment, in which programs must multi-task in order to multi-thread. ICL has not therefore had to re-architect IDMS to cater for growing online use — a task which both Cullinane and Cincom have had to undertake in the last few years to produce their high-performance multi-threading versions, viz IDMS 5.0 (Software File, November 2, 1978) and Total 8.0 (Software File, June 15, 1978).

SALES, purchase and nominal ledger, and payroll software for the Adds System 70 and 75 have been among the first fruits of Gemini Computer Systems' new microcomputer division, Gemini Mirosoft, based in Manchester.

Lloyd's contract

LDGICA has won a contract to extend the ships database maintained by Lloyd's of London Press. The main enhancement will be the incorporation of ownership details linking the 33,000 vessels currently held in the database to about 12,000 ship-owning companies.

The PDP-11/70-based system is used to produce publications such as Lloyd's List, Lloyd's Shipping Index and Lloyd's Voyage Record.

IBM version

PACKAGE Programs has announced an IBM System 34 version of the MMS general ledger and financial reporting system. Written in Cobol, it requires a 48K System 34 and costs £10,500.

First fruits

SALES, purchase and nominal ledger, and payroll software for the Adds System 70 and 75 have been among the first fruits of Gemini Computer Systems' new microcomputer division, Gemini Mirosoft, based in Manchester.

Real time extensions on Basic interpreter

A BASIC interpreter, including real time extensions for such applications as instrument control, has been developed by Research Resources Ltd of Welwyn Garden City. It is currently available for the South West Technical Products 6800 and for the CT-82 graphics VDU.

A version of the interpreter, which is called LabBasic, is under development for the Commodore Pet and the company is also working on a compatible compiler that will

generate EPROMable machine code.

Among LabBasic extensions specifically designed for simplifying the interface to external equipment are Sense, Flip, and Delny commands for the control of input devices; commands to change the state of output lines; and facilities to generate pauses of known length.

The system also includes an interrupt clock. The two current versions of LabBasic are priced at £25.



FEELER gauges are "blades" of various thicknesses with which the engineer or mechanic can measure the gap between two components. They can be attached to a key-ring, and used singly, or held adjacent to each other in blocks of two or more.

This week's problem is to work out a circular array of five

"Integer" gauges, such that all integer totals from 1 to 21 may be measured with the technique already described. The first question is "Which five numbers will do the trick?" and the second "Where precisely must they be placed round the key-ring, in relation to each other?" See page 45 for solution.

COMPUTER WEEKLY

is holding its Annual Ball

on Friday, October 12 at the Royal Lancaster

Computer Weekly is holding its fourth annual Ball. Last year nearly 700 people attended what has come to be regarded as the computer industry's big night out.

This year the Ball will again be held under the patronage of the British Computer

Society. And proceeds will once more be devoted to a deserving cause associated with the computer industry.

So why not help us to help others? And at the same time enjoy a pleasant evening with friends and colleagues.

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Confusion for users over which 290X op system will be used

THE good news for ICL 290X users is that a new operating system with integrated teleprocessing capabilities is on the way to see them into the 1980s.

The bad news is that a controversy has arisen over which of two products, Ice or Supremacy, is to be offered and, once again, the poor bewildered user is left guessing.

There are four existing operating systems available on the 2903, 2904 and 2905. They are: Exec 1, which runs on all models; Exec 2, which runs on all but the cut-price models; Exec 3, which runs on the 2904/30 (CW, March 23, 1978); and Exec 5S, which runs on the 2905 (CW, April 28) and includes microcode assists for RPG II and disc accesses.

All are compatible supersets of the one below, and are based on the Exec used on the small 1800. Internally they are collectively known by ICL as Emoe.

No one can deny the enormous success of the 290X line, which took ICL itself by surprise. It turned out to be the right product at the right time, and the success seems to vindicate the choice of operating system.

Nonetheless, it is a predominantly batch operating system, and the demand today is mainly for transaction processing. The 290X represents the same half-way house between the two as IBM's System 34 compared with System 32.

IBM has, however, decreed that the future for System 32 is System 38, designed for transaction processing and database applications.

ICL has long been aware of the need for something comparable and was given a grant by the Department of Industry to invest in deciding upon a new operating system.

One of the criticisms of ICL in the past was that, unlike IBM, its resources were so thin that it could only invest in one solution to a particular problem, and if the one chosen turned out to be a dead end, the company would be in trouble.

ICL is a big company now, research and development budgets are a little fatter, and two alternative projects have been under way for some time to develop the appropriate operating system.

One, code-named Ice, Integrated Executive, is completely new, the other, code-named Supremacy, is defined as a "design concept for the future of Exec" essentially major extensions of Exec to meet the future requirements of 290X users.

The controversy has been whipped up over the fact that now there are two apparently viable options open to ICL, one will have to be dropped.

It appears that the latter, Supremacy, is presently in the ascendancy, and, remembering all the problems ICL had in getting VME/B and VME/K right, one can understand why.

Whichever route is chosen, users should be able to rely upon almost total compatibility with the existing Execs. If this proves not to be the case, ICL will put in, as a last resort, a new feature, business office covered 290X user base.

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OP SPOT

College prepares school leavers for job market

AS the computer industry grows, more and more sites are having difficulty in finding experienced and qualified staff.

To overcome this problem, many are now looking to recruit staff at junior level and fill the senior positions from within the company.

Colleges of further education have a big role to play in this context. In fact, the main aim of "vocational further education" is to prepare young school leavers for the job market, according to Angus Redpath of Annesland College in Glasgow.

A senior lecturer, Redpath writes, "The main computing course run at our college is the Scottish National Certificate in computer operations. It is a one-year, full-time course and leads to the examinations of the

Scottish Business Education Council."

The course is made up of five subjects: operations, programming, data processing, computer theory and accounts.

He goes on "While the course is primarily concerned with computer operations, we are aware that employers want staff at the junior or trainee level, who are not over-specialised in operations to the exclusion of all else."

So the students are trained up to junior operator level although, according to Redpath, they are capable of carrying out most operational duties as soon as they leave the college.

To gain practical experience of operations, they spend at least two weeks at one of the local sites.

"This is an intensive part of

the course and we are making efforts to extend it. The good relations we have built up with companies over the years have helped towards a clearer understanding of mutual needs and requirements."

Throughout the year, the students take part in college-based projects which are intended to be of practical benefit.

"The main reason for their inclusion in the course is to knit together the aspects of computing dealt with under the various subject headings."

"This type of work has a direct bearing on their studies and helps to maintain a high level of interest and motivation during a very busy year."

Although the college does not have an in-house mainframe, its computing facilities are more

than adequate — a Commodore Pet, data prep equipment, and links to a Prime 400 and a DECsystem-20.

"The net result is that the students are kept very busy from day one of the course. This is no soft option as an alternative to work."

Redpath says that the demand for the college's students is so great that about 90 per cent of them have positions in the industry before they have completed the course.

He goes on, "Feedback indicates that operations is not only a worthwhile career in itself but that the opportunities of moving into areas such as programming and analysis are good. The majority of the students graduate from their initial appointments to higher posts within 18 months to two years."

By Bernard Allen

Terminating the printer under Univac OS

AS pointed out by Colin O'Keefe of British Airways' London site, Univac OS operators should always stop the printer before cancelling a job.

And now Alan Winter of BP Oil in Hamel Hempstead, gives similar advice in relation to the Univac OS 1100 environment.

He comments, "Univac operators, particularly trainees, should take care when cancelling a job which is in the process of being printed. Instead of Cancel, we use a 'SM device E' keying where E stands for error."

Winter also refers to two other commands Univac OS 1100 operators use to control the printer: "SM device T", to terminate the device, and "SM device I", which stands for initiate, or start it.

"Whatever the reason for terminating the printer, the operator must take care to re-align the paper before re-initiating the device. Otherwise, the next print-off will be mis-aligned."

Ex-TOPS students happy in their work

FORMER TOPS student Steve Ward (Op Spot, July 7) has a chance of moving up to the position of senior operator, just eight months after completing his operations course at Borehamwood College in Herts.

Steve, who works at Jermy Industries' site in Sevenoaks, Kent, told me, "Two of our operations staff gave in their notice recently; one of them is a senior operator, and the position is to be filled from within the department."

There are three candidates for the position, and the operations manager is to work with each of them, to find out who is best suited for promotion.

Dave Townsend, another ex-TOPS student whose progress we have been following, is

"working harder than ever" so that's the way he likes it.

An operator at the First National Bank of Chicago in London, Dave said, "I get it all, everything, from running the systems to using the IBM mainframes. It suits me because I learn more and don't get bored."

Dave attributes the reason mainly to the fact that he is employed at a small site. It points out that recent developments have added to his job.

"Until recently we had a team of five operators, two on day and three on evenings, but of them left and the company has decided not to replace them."

"In addition, the workload has increased all the time — in fact, in fact, we have installed two new devices so far."

Tidiness is functional — nit-picking is not

VIEWS on keeping the computer room clean and tidy vary considerably from one installation to the next.

At one site I visited, little attention is paid to the matter, with the result that tapes, discs and boxes of stationery are kept on the computer room floor — due mainly to a lack of storage facilities in the room and not the fault of the operators.

A rather different approach is used at another installation I know of. At the end of the night shift, the operators are expected to clean all work surfaces and VDU screens.

Now, vacuum-cleaning printers and wiping print trails is fair enough, but at this site the operators are expected actually to remove the trails and open up the back of the units for hoovering.

One bright morning the manager sauntered into the printer area and took it upon himself to inspect the units, one of which he discovered was a bit dusty. He immediately seized on this and ordered the operators — who had just completed a 12-hour night shift — to clean all the printers again. (If ever an operators' union was needed, it was needed on that occasion.)

It is obvious that neither site puts the right emphasis on com-

puter room tidiness. And it is important, for a tidy room is a prerequisite to efficiency in operation. But it should not be taken to extremes.

From the efficiency point of view, staff should clean up as they go along, returning media to the appropriate storage rack as soon as they are no longer required by the system.

Consider, for example, a set of jobs which uses a lot of tape. Some of which are needed once per run, while others are required several times.

As each job finishes, it is too easy to put them away in a "minute" attitude. I have seen this myself. But in the long run such an approach makes the task more difficult.

The operators should use the run documentation to find out which tapes are needed more than once and keep them by the console. The tapes should be returned to the rack as soon as the system has finished with them.

Regarding the maintenance of peripherals, it is important that they are cleaned regularly to prevent dust build-up and errors in print quality. And that's all.

Hardcopy log commands

THE IBM OS operator uses two commands in relation to the system hardcopy log: Log and WriteLog.

Log is used to record messages on the hardcopy and has the following command format:

L'Message Text'

Typically, the operator will record information relating to job cancellations and changes in

the state of the system, such as when one or more tape or disk drives are under service.

And, provided that WriteLog is used to print the hardcopy log, the operator can use the log as a means of dealing with enquiries. WriteLog has the following format:

W'Output Device'

MICRO NEWS

By Martin Banks



Meter reader

THE M50 hand-held data capture terminal from ICSL Microsystems, seen here in the final stages of assembly at the company's Borehamwood facility, is now being offered to gas and electricity authorities for meter reading applications.

This is the market being investigated by Plessey with a specially developed portable system (Micro News, April 28).

ICSL estimates that the European market for such terminals could be as high as 25,000 units.

In operation, each M50 would be loaded from an authority's central computer with all information necessary for the meter reader's "walk". The reader, at each reading point on the walk, enters the meter reading into the terminal's memory. At the end of the day, this data is read back into the central computer.

AMD-Zilog race for Z8000 support

SOMETHING of a race is building up between Zilog and Advanced Micro Devices as to which will be the first with the most in supporting the Z8000, 10-bit microprocessor.

Following the recent announcement by AMD of three new peripheral chips for the processor (Micro News, July 19), the company has announced a new development system that will not only emulate the Z8000 prior to its availability, but will also allow both hardware and software development on the Intel 8080 and 8085 processors, as well as the Zilog Z80, and the Z8000 as it becomes available.

To complement this, AMD is also planning to introduce a Z8000 evaluation board which, in addition to operating in stand-alone mode, can also be plugged into the new development system. Both are expected to be available by the end of this year.

Zilog, for its part, has just introduced a single-board Z8000 development module, but a full development system is not expected until early next year. Its introduction, however, is likely to be followed later in the year by a general-purpose computer system, which is expected to employ a multiple processor configuration.

The AMD development system, known as the System 8/8, in fact uses an 8080 processor chip. The minimum configuration, costing £5,095, includes 32K bytes of RAM, dual floppy disc drive offering 512K bytes, one RS232 port and six parallel ports.

The minimum software is an 8080 macro assembler and a Z8000 translator and macro assembler. This latter is currently suitable only for software development as it does not have sufficient operating speed to emulate properly a hardware configuration system. There is also a text editor, link-loader and disc operating system.

Options for the system include memory expansion, Z80 and 8085 CPU cards, a circuit emulation board, and a hard disc system. Software options include Basic, Fortran, Pascal and C.

This is the primary finding of a report prepared by Software Technique Inc of the US, and published in the latest issue of Microcomputer Analysis.

The degree of the importance to the marketplace is estimated in the report as resulting in a 80% annual growth rate in sales of the devices over the next few years, with a share of the microprocessor business rising from 6% now to 23% by 1983.

One of the principal reasons cited by the report is that the 16-bit address bus of the popular 8-bit microprocessors is placing increasing capacity restrictions on system memory. It points to the fact that in the early Seventies, 64K bytes of memory seemed huge.

Now, it is a Megabyte of memory that seems prodigious for microcomputer systems. The report concludes, however, that by the end of the 1980s, the new 16-bit processors now coming on to the market, a

and Cobol high-level languages, and macro assemblers for the optional CPUs.

For AMD, however, the big win is likely to come early next year with an upgrade of System 8/8, known as System 8/16. This will incorporate a Z8000 CPU board as standard.

Its evaluation board, costing about £700, will include two RS232 ports, 24 parallel I/O lines, 8K bytes of RAM and 12K bytes of PROM/ROM space — 2K bytes of which will be taken up by the monitor. Options for this will include an Ascl line assembler, and a keyboard and 20-character display.

Both Zilog and AMD state that samples of the Z8002 variant of the 16-bit processor are available. AMD, however, is understood to be contractually obliged, as part of the second source agreement, to wait 90 days from Zilog's announcement of availability before releasing any parts. Zilog claims to have had samples available since March.

The Zilog development module features a Z8002 processor, 2K words of monitor, 16K words of RAM, dual serial interfaces and 32 programmable I/O lines. It is capable of being used either as a hardware and software development unit, or being designed into a system configuration.

Its prime advantage over the AMD evaluation board is that it is available now.

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Fairchild's figures leap

WITH over 93% of its shares now bought by Schlumberger, Fairchild Camera and Instrument has announced quarterly financial results that include a 32% jump in sales and a doubling of profits over last year.

Second quarter sales were \$167,999,000, 32% up on the same quarter last year, and 15% up on the first quarter of this year. Profits, at \$12,692,000, were more than double those for the same quarter last year, and a whopping 78% jump on profits for the first quarter of this year.

Figures for the first half of this year show the company with a rise in profits of 93%, to \$19,619,000, on sales that advanced by 28%, to \$312,847,000.

DESPITE the fact that the wider word size of 16-bit microprocessors offers designers little intrinsic advantage in the development of microcomputer systems, these devices will assume considerable importance in the marketplace by 1983.

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Now, it is a Megabyte of memory that seems prodigious for microcomputer systems. The report concludes, however, that by the end of the 1980s, the new 16-bit processors now coming on to the market, a

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PEOPLE AND EVENTS

Major changes at Digital Equipment

MAJOR management changes have been announced at Digital Equipment, which include the appointment of UK sales, marketing and CSS managers, and CSS and engineering managers for Europe.

Former UK marketing manager, Tony James has been promoted to sales manager in the UK. He has spent two years as marketing manager at the company's European headquarters in Geneva.

As sales manager, he succeeds Dave Buckingham who now becomes manufacturing, distribution and control product manager for Europe.

Bill Passmore takes over from James as marketing manager. His most recent position was that of control and south-west district manager for Digital. He joined the company in 1971, and was previously with Nuclear Enterprises and EMI Electronics. He is replaced by Frank Turner.

Manager for computer special systems in Europe is Kristoffer Sygel, who will be responsible for the four special systems groups in Reading, Munich, Paris and Stockholm. He was formerly CSS business manager in Stockholm.

Stuart Haughton has become manager of the UK CSS group, based in Reading. His previous experience includes several years with the UK atomic energy authority.

Formerly ESE manager in Reading, Jim Wade has been appointed European engineering manager, and will be responsible for engineering operations in Europe including product development, management, product planning, safety standards and the European software engineering group already established in Reading. Dick Davies assumes the role of ESE manager.



TRAINING manager of Rediffon Computers, Peter Heddow, is seen here showing a memory board to children from Ifield School, Crawley, who attended a three-day Careers Exhibition at Crawley Technical College. Rediffon was among 88 local firms at the exhibition, which was attended by over 3,800 schoolchildren. One of the main attractions for the children was the R850 terminal, which they all had the opportunity to test.

Terry Baxter has joined Euroco Computer Services as systems development manager. Formerly director of Telecom-

puting's system division, he will now be responsible for production of all software products and turnkey systems.

By Judith Morris

BIS prize for student

The BIS Applied Systems cash prize for the best final year project at North Staffordshire Polytechnic has been won by Mrs Diane Blanton. Her project was entitled "The implementation of a natural language processor using compatible semantic derivations".

BIS said that Diane had shown "exceptional merit and effort" in developing her project, in which she produced programs which implemented principal strategies.

Prizes were also awarded to Neil Taberner for practical programming and Michael Ames for the best practical workshop. The awards are made to encourage undergraduates in their practical course work.

Daniel Wendock, formerly director of operations for ITT Africa and the Middle East, has become group executive for the same area. His predecessor, John Gullifoye, has been appointed president of ITT Europe. Wendock will report directly to James Lester, executive vice-president and a member of the ITT office of the chief executive.

Brian Sear has become manager of venture development, a newly created position with GenRad. He will be involved in developing five-year strategic plans involving identification and creation of new business opportunities. He was previously vice-president and general manager of Fairchild's sentry systems division in California.

DIARY

AUGUST 18-22
Third Rocky Mountain Symposium on microcomputers. IEE Computer Society, Plenary Park, Colorado. Contact: Michael Tindall, Dept of Computer Science, Colorado State University, Fort Collins, CO 80523.

AUGUST 27-SEPTEMBER 2
Trade and technology in white. Orb Foundation, Wembley conference centre, Wembley.

SEPTEMBER 4-7
Compeon Fall '79. IEEE Computer Society, Capital Hilton Hotel, Washington DC. Contact: Compeon Fall '79, PO Box 639, Silver Spring, MD 20901.

SEPTEMBER 9
The future of real time languages in process control. BCS Process Control specialist group. Reading University, Reading, RG6 2AA.

SEPTEMBER 10
Database systems and information retrieval. BCS Information Retrieval group. Computer Laboratory, Cambridge University, Cambridge.

SEPTEMBER 11
Performance management. IDPM West London and Oxford branch. Tesdata House, Hatfield Road, Slough, RG6 2AA.

SEPTEMBER 11-12
Computing and communications in the 1980s. Martin Simpson Research Associates, Park Lane Hotel, 30 Central Park South, New York.

SEPTEMBER 12-14
Shape recognition and artificial intelligence. AFTEC and IRIA. Toulouse, France.

SEPTEMBER 13
Optimal control of large scale systems. IEE, Savoy Place, London WC2R 0EX.

SEPTEMBER 17
An afternoon with James Marto. IBM CUA and Butler Cox Associates, The Grosvenor House Hotel, Park Lane, London.

SEPTEMBER 17-21
Computer science and law. Course. CREST and SRC. Swansea University, Swansea. Tel: 0752 25278, ext 802.



Peter Chapman has been group manager for Fairchild semiconductor division, where he will have special responsibility for microprocessor applications technology. He joins the company from ITT Business Systems.

Keith Dumbleton has been appointed managing director of Syvace, the electronic systems and components company. He succeeds Roger Cooke, who remains as chairman of the company. Dumbleton joined Syvace as sales director after time in the industrial sales division of Mullard.

Civeware File

by Dn

I ONCE BUILT A VOICE-OPERATED STEERING DEVICE.



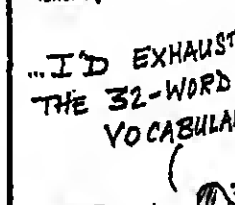
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TO encourage the growth of manufacturing industry in the Irish Republic, the government has assembled a considerable package

of grants and tax relief. PAUL NORRETT here describes the advantages, which include no tax on exports until 1990, a reduced cor-

poration tax of 10% on profits until 2000, non-repayable grants for site development and tax-deductible grants on the cost of plant.

Tax advantages of running a business in the Irish Republic

THE economic advantages of running a business in the Irish Republic can be summarised in two words: tax and cash. The Irish government has put together a package of incentives that are very attractive.

The tax advantages are best for the manufacturing company with a high export ratio. As the Irish market, in population terms, is less than a third the size of London, manufacturers will almost certainly be exporters, therefore the incentives are in the right place.

For a company wishing to set up a factory in the Republic there will be no tax on export profits until 1990 provided that the export investment commitment is made before 1981. From January 1, 1981 until December 2000 a reduced corporation tax of 10% will apply to all profits derived from manufacturing in Ireland.

Existing manufacturers that are receiving fiscal advantages from the system of export sales relief will not be adversely affected by the introduction of the new 10% rate. The two schemes will run concurrently until 1980. After that date the 10% corporation tax rate will apply to all manufacturers in the Irish Republic.

The capital allowances are not significantly more attractive than UK incentives offered for some assisted areas. The Irish offer 100% first year allowances on the gross cost of plant. This is quite generous if a 50% grant was given — the UK usually deducts the grant from the allowance.

For readers not familiar with

The big incentive is the non-repayable cash grant towards the costs of site development and purchase of fixed assets.

these terms a few simple figures may help to illustrate the point: suppose a company buys £100,000 of machinery and secures a 30% cash grant. In Ireland the £100,000 may be deducted from the first year's profits, whereas in most UK-assisted areas, if a 30% grant was obtained, only £70,000 would be deductible when calculating taxable profits.

Dividends paid to overseas corporate or individual shareholders will be fully exempt from Irish tax, and there

are no withholding taxes. Ireland has double taxation agreements with many countries including the UK, the US and most of the EEC. This means that in many instances profits repatriated from Ireland as dividends will be either wholly or partially exempt from tax in the country of receipt.

The big incentive is the non-repayable cash grant towards the costs of site development and purchase of fixed assets. If a company was considering a factory in the western half of the Republic, then up to 50% of the fixed investment costs would be paid by the government.

In these matters the government appears to be capable of acting quite quickly. For example, the DeLorean deal for manufacturing the DeLorean sports car was a £85 million investment package and was completed in 45 days. The deal included a significant subscription for government shares.

Once the factory has been set up there are additional grants available of up to 35% for the fixed costs of expansion and modernisation. There are also subsidies for in-house research and development programmes. The training grant is another useful benefit. Grants are paid

towards the cost of training programmes for workers in new industries, for sending personnel abroad for training and for hiring training consultants.

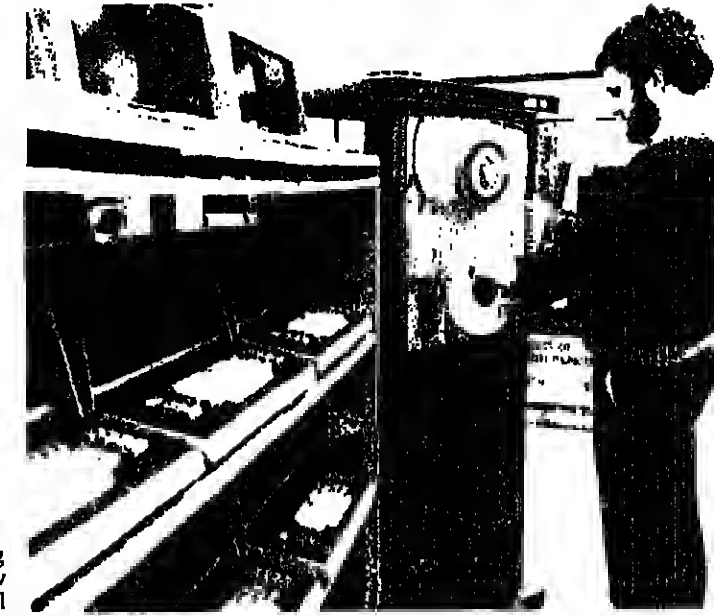
In addition to government grants there are also facilities for raising capital through private and State-sponsored finance houses.

For exports, credit insurance covering commercial and political risks is provided by the government. This enables export credit finance to be obtained from the banks at a preferential rate.

The financial and fiscal ad-

Dividends paid to overseas corporate or individual shareholders will be fully exempt from Irish tax, and there are no withholding taxes.

vantages of setting up in the Republic of Ireland can be summarised in a simplified example. Assume that a minicomputer manufacturer has designed a product with proven market potential. To set up production the company needs £50,000



The town of Ballincollig in County Cork is the location of the Data 100 plant that builds most of the equipment sold by the company in Europe. The main product is the Kaybatch multi-terminal data entry system, one of which is seen here being checked out. The Irish plant was opened by Data 100 four years ago and now employs more than 180 people. Future products to be built there could include the Syvace line of intelligent terminals, because Syvace's Canadian based parent, Northern Telecom, now also owns Data 100 (CW, December 7, 1978).

square feet of light industrial space, £50,000 working capital and £500,000 fixed capital. It expects to employ about 50 people. Sales expectations are: year one, £500,000; year two, £1 million; year three, £2 million, with a constant 30% before tax net profit.

If the company wants to set up in the UK, the two main problems are finding the right location and financing £500,000.

There may be some difficulty in getting finance on realistic terms because of the financial institutions' apparent reluctance to back technology. However, assume finance is arranged at an average cost of 20% and factory space at £3 per square foot. Taking these simple figures and making some fairly crude calculations, the three-year aggregate after tax profit would be about £610,000. The main de-

duction is the cost of finance. There would be little UK tax payable in the first two or three years because of the capital allowances and stock relief.

To make a simple comparison for the same set-up in Southern Ireland requires a broad-brush approach on comparability of locations.

Assuming the sales forecast and production capability would be the same as in the UK, the after-tax profits would be higher. The difference arises from investment grants, cost of factory space, and finance. If a 30% grant was allowed on the fixed investment and balancing finance obtained at 12% with factory space at £1.50, the three-year aggregate after-tax profit would be £1,229,000.

The tax advantages would start to show after the first three years.

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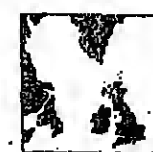
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IDA Ireland also has offices in Dublin, Amsterdam, Paris, Cologne, Stuttgart, Milan, Copenhagen, Madrid, New York, Chicago, Los Angeles, Houston, Toronto, Sydney and Tokyo.

INTRODUCTION TO PASCAL

Use of booleans and state variables

Part 7

THIS article introduces the use of booleans and state variables in writing readable programs.

Recap, and on to checks

In Part 5 of this series, the outer shell of a Timechecker program was discussed. The main step in the program was a call to a procedure to input times for one employee for one day. Last week we looked at the details of inputting these times. Now, like any good programmer, we must complete the input procedure by checking the times for inconsistencies such as signing off before signing on or having different days for the times. (Blaze Inc. does not have shift working yet.) The full list of checks is:

1. All days are the same.
2. The mornings-on time is after the gates open at 7.30 am and the afternoon-off time is before they close at 6.30 pm.
3. Both "off" times are after their respective "on" times.
4. The time taken for lunch is at least the required 30 minutes.
5. If any of these gives a negative result, the error routine is called, which, on return, positions us at the start of the next check. The question is whether it is meaningful to do subsequent checks if one has failed. In the last case, the answer is No. If the employee muddled up the on-off times (check 3), it is more than likely that the lunchtime check will fail. This could give a false picture, since muddles can be sorted out easily but a lunch error must be reported to the Personnel Officer. As a result, the fourth check should be omitted if the third failed. Of course, we want to do this without repeating the question and therefore need to preserve the answer somehow for future reference. For this, we need a boolean.

What is a boolean?

A boolean is a type of variable which is better known as a logical (in Fortran) or a flag. It takes a value that is either true or false. True and false are also the results of conditions which we use freely in IF statements. Thus we can say that the expression

IF expression THEN...

must return a boolean value. Boolean variables come into play when we need to preserve this condition for future reference, as in the case discussed above.

In general, assume that the states of all four checks should be preserved. So we declare four boolean variables

VAR dayerror, gateerror, inouterror, luncherror: boolean;

A day error would be established by looping through the four times and throwing out any one that does not conform.

```
today := times[morning]. day;
dayerror := false;
FOR session := succ(inmorning) TO outafternoon DO
  dayerror := day error OR
    (times[session].day < today);
```

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SHORT COURSES IN MICROPROCESSORS

The following courses will be held during the Autumn Term:

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- Introduction to Microprocessors (Afternoon and Evening)
- Software Design for Microprocessors (Afternoon and Evening)

Further details from: Mrs. P. A. Ingram, School of Information Sciences, The Hatfield Polytechnic, P.O. Box 109, Hatfield, Herts. HA1 100. Tel: 263

This little snippet illustrates that loops can count over symbolic values as well as numbers. The succ function gives the successor; succ(inmorning) is therefore identical to outmorning. Dayerror will remain false if no day is out of line. Now we can say out many points in the program

IF dayerror THEN error(4)

without repeating the lengthy question.

Boolean and other functions

Moving on to the gate error check, we see that it entails finding out whether times[inmorning] (which is a record of three fields) comes before gateopen, which is set up as follows:

```
VAR gateopen: time;
WITH gateopen DO
  BEGIN
    day := today;
    hour := 7; min := 30;
  END;
```

While it is sensible to define equality of records (ie time1 = time2), ordering depends on the meaning of the fields and cannot be established simply by using an operator like < (less than). We must enhance the language by defining our own "operators" to work on times. These are called functions, and can be used as follows

```
gateerror := timecompare(times[inmorning], before, gateopen)
OR timecompare(times[outafternoon], after, gateclose);
Timecompare is a function which takes three parameters — a time, a relation, and another time, and returns a boolean value, true or false. Its Pascal declaration is:
```

```
FUNCTION timecompare (t1: time; r: relation;
t2: time): boolean;
```

What are relations? Here we make use of symbolic values again, coming up with

TYPE relation = (before, beforeequal, after, afterequal); which is far safer and more readable than defining codes for them (eg 1 means before, 3 means after etc.)

Inouterror will use timecompare in the same way and once established, we can conditionally perform the last check ie

```
IF NOT (inouterror THEN
  luncherror := minsbetween (time[outmorning],
    times[nafternoon]) < lunchtime;
```

Here there is another function, this time one that returns a value in minutes which is compared, using the built-in less-than, with lunchtime, which is also in minutes. The minsbetween declaration is

```
FUNCTION minsbetween (t1, t2: time): minutes;
```

Inside timecompare

The above declarations set out what the functions do but obviously it is necessary to define how they do it as well. Take timecompare: It is given two times and must see if they conform to the specified relation. A neat way to do this is to set up two booleans

VAR less, equal: boolean;

and consider each of the fields of t1 and t2 in turn, setting the states of less and equal appropriately. Thus

```
less := t1.day < t2.day;
equal := t1.day = t2.day;
less := less OR (equal AND t1.hour < t2.hour);
equal := equal AND (t1.hour = t2.hour);
less := less OR (equal AND t1.min < t2.min);
equal := equal AND (t1.min = t2.min);
```

```
state := searching;
REPEAT
  reademployee(t1);
  IF NOT THEN state := notthere ELSE
  IF employee == leave THEN state := found;
UNTIL state == found;
('Now do different things for the two exit conditions')
CASE state OF
  found: ('Calculate salary, leave and pension due')
  notthere: ('Issue an error message')
END;
```

Figure 1. Search for an employee who wants to leave.

COURSES

EUROMICRO, the European Association for microprocessing and microprogramming, is organising its sixth annual symposium, called EuroMicro 80. This will be held in London, and workers in the fields of microprocessing and microprogramming are expected to exchange ideas on the latest developments. The structure of the programme will consist of three sessions, devoted to brief, up-to-date presentations of results and applications. The conference will take place from September 18-19, and those wishing to submit papers should send an abstract before

May 1, 1980, to the Programme Chairman, Mariagiovanna Gami, Istit. di Elettronica, Politecnico, Piazza 1, Da Vinci 32, I-20133 Milano, Italy. A RANGE of courses can be run on a customer's own premises, has been introduced by the training division of John Ball Computer Services. They are primarily on minicomputer systems, and cover operating systems, assembler languages, programming techniques and microprocessor applications. Further details from Helen Morgan, John Ball Technical Systems, Clark House, 2-4 Albert Street, Fleet, Hants. Tel: (0251) 28014.



by Dr Judy Bishop

Booleans are great — but suffer from the basic restriction of only reflecting two states, says Dr Judy Bishop, in the seventh part of her 10-part series.

A lecturer in computer science at Witwatersrand University in South Africa, Dr Bishop first became acquainted with Pascal when she was studying for her PhD at Southampton University.

While this may look a bit complicated, it is certainly easier than the equivalent IF statements. (Cobol programmers try to tell me!) Having established these two states, we then use the CASE statement, which proved so useful in the previous article, to design the correct value to timecompare.

```
CASE OF
  before : timecompare := less;
  beforeequal : timecompare := less OR equal;
  after : timecompare := NOT less;
  afterequal : timecompare := equal OR NOT less;
END;
```

All in all, the boolean variables have saved us from writing long and lines of conditions and IF statements.

When two is too few

Booleans are great, but suffer from the basic restriction of only reflecting two states. One of the most common algorithms in computing — that of searching a list, file or array for a specific element — requires at least three states, namely:

1. The element has been found.
2. Still searching.
3. The end of the list has been reached without finding the element.

No problem. Booleans are, after all, just a special kind of symbolic type

TYPE boolean = (false, true).

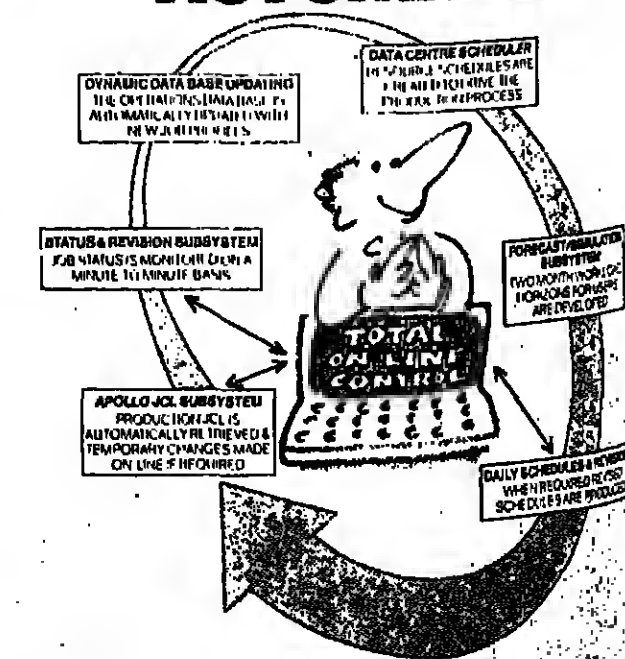
We can therefore go ahead and declare

VAR state: (searching, found, notthere);

The portion of program to do the search is given in Figure 1.

Part 8: Dynamic people — creating space at runtime and the use of pointers.

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Philips' terminal systems take off

COMPUTERS IN BANKING ROUND-UP

AFTER a somewhat slow start with the PTS 6000 banking terminal system, which first made its mark in the local authority market rather than the banking and savings sector, Philips' terminal systems business is beginning to take off in the UK.

The first building society customer, the Midlands, opted for PTS 6000s at the beginning of the year (CW, January 25) and the real breakthrough came with the order from the Halifax Building Society, the world's largest. The initial order is worth well over £10 million and covers the society's existing 400 branches (CW, July 12).

However, the society is opening new branches at a rate of 40 a year, and the business that this will generate, together with the likelihood that the Halifax will implement a cash dispenser network, makes the long-term potential of the contract enormous.

A third building society is expected to announce shortly that it has chosen the Philips system, while the company has completed delivery of equipment under the £2 million contract with Scottish Trustee Savings Bank, and looks for additional business from that quarter (CW, May 4 1977).

Philips claims that it has 40% of the local authority market for cash receipting systems with the PTS 6000, the other major suppliers being ICL, Datasab and Olivetti.

It also seems likely that the Big Five clearing banks are beginning to slacken their ties to their traditional US suppliers, principally IBM, Burroughs and NCR, and to looking seriously

at the offerings of European suppliers.

The impending acquisition of the Four Phase Systems marketing company in the UK, exclusively reported in Computer Weekly (July 28) will lead to a broadening of what Philips Data Systems calls its subsystems division.

Four Phase installed 40 systems with 25 customers in its 24-year UK history, and the target market Philips is aiming at is the one currently supplied by the big traditional key-to-tape system suppliers, all of which have diversified their product lines to provide substantial local processing capability on what is still primarily a data entry system.

It puts an annual £40 million value on this market, which it identifies as being supplied by 10 companies. In descending order of market share, they are: Redifon, Ventek, Data 100, CMC, Computer Automation, GEC Computers, Data Logic, Inforex, MDS and ICL.

It is aiming to win 10% of this market with the Four Phase system, which is being renamed the P7000. It is built around a powerful 24-bit processor which can support up to 32 terminals. Cobol programming and a word processing package are available

for the P7000.

Communications emulations for the local authority market have been done for attachment to Honeywell, IBM, Burroughs, ICL and Unisys mainframes in the UK, so Philips Data Systems is confident of its skills in this area.

A third terminal systems product will be introduced in the UK if there proves to be a need for it: the P8000. This is a lower level line of general purpose terminal systems based on the hardware of the PTS 6000, and able to use all the communications software developed for the banking product.

The subsystems division now forms one arm of Philips Data Systems, the other being stand-alone accounting and small business computers. But of all the potential markets, the building society and banking markets look the most exciting, with forecasters anticipating enormous demand for online customer-operated cash dispensers and transaction terminals.

And the good news about that is that most of the cash dispensing mechanisms come from either Chubb or De la Rue of the UK. The Philips PTS 6000 uses the Chubb mechanism.

Four Phase reports from Cupertino, California that in its second quarter, ending June 30, net profits were up 38% at \$3.9 million on turnover up 20% at \$40.3 million. Turnover for the past four quarters was \$80.2 million. The agreement under which Philips markets Four Phase products in Europe has been extended in December 1981.

Pilot scheme likely result of study into EFTS for shoppers

THE feasibility study on an Electronic Funds Transfer system for UK shoppers should be completed later this year, after which the major clearing banks will decide whether to go ahead with a pilot project.

The study was initiated following a working party report which established the feasibility of EFTS (CW, October 16, 1978).

The feasibility study will focus on a particular town, possibly a seaport, since most people in such a town both live and work there. The chosen town will not necessarily be the one adopted for any pilot experiment which may follow the report.

After examining the terminals now on the market, the project team has concluded that no equipment which would meet the full requirements of an EFTS retail system currently exists.

If the go-ahead is given for a pilot project, it could not get under way before 1982-83 at the earliest. The British banks are looking at something much more ambitious than the system currently running in one small town in France. Ultimately they envisage a large proportion of retail and service

outlets being equipped with terminals capable of reading customers' magnetic stripe cards and doing a direct debit on an account held at any of the 11 banks and two credit card companies which have commissioned the study.

In the French Alps town of Bourg-en-Bresse, 54 merchants, including supermarkets, boutiques and petrol

stations have installed IBM 3608 direct debit terminals, online to the Banque Regionale de l'Alsain's IBM 370/138 mainframe (CW, March 15).

The experiment is reported to be a great success — except in the dress shops, where women have been reluctant to use their cards. The bank suspects that women do not want their husbands to know how much they spend on clothes.

Third order

TANDEM Computers, manufacturer of the high reliability Tandem 16 minicomputer system, has won a third order from Barclays Bank. The machine on order will have three processors and will handle foreign exchange data capture.

Prices for the terminals will fall from an average \$30,000 per unit today, to \$20,000 by 1983.

Data Communications in Branch Banking, Frost and Sullivan Ltd, 104-112 Marylebone Lane, London W1M 6PU. Telephone 01-488 8377.

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Data Communications in Branch Banking, Frost and Sullivan Ltd, 104-112 Marylebone Lane, London W1M 6PU. Telephone 01-488 8377.

Micro-based translator

A LANGUAGE training school in Aldershot is so convinced of the value of microprocessor-based pocket translators that it is supplying each of its students with one as part of the course material. The machine is the US-made Grog M100, pictured right, which is claimed to be able to translate phrases as well as single words. Different languages can be provided by exchanging a ROM (pictured left).

Lou Fearnley, principal of the Cergate Language Centre, describes these machines as "only a start."

"Soon," he says, "electronic translators with large vocabularies, syntax and idiom capabilities will become widely used in the business community, where traditional methods have not proved wholly successful."

'Personal' trade association call

DOES the personal computer business in the UK need a trade association to look after its interests? In the view of Paul Rayner, new manager of the Computer Workshop store in Leeds, it does.

Rayner is writing to about 100 companies operating in the field in the UK, suggesting that a trade association be formed.

He says that though more and more people are becoming aware of the importance and impact of microelectronics and microcomputers, the only voice that is raised on the subject consistently is that of trade union leader Clive Jenkins.

Rayner points out that he does not necessarily disagree with what Jenkins has said, but he feels strongly that the industry involved in manufacturing and selling the systems needs a coherent and unified voice.

"After all," he says, "we may all be small companies, but cumulatively we are probably as big as ICL."

He visualises perhaps four meetings a year, coinciding with the main exhibitions. At other times, a committee would look after the association's affairs.

Rayner can be contacted during working hours at Computer Workshop Leeds, West Park, Leeds, LS16 5LQ.

Extracting the meaning from legal papers is aim of course

A COURSE on computer science and law, with particular emphasis on how computers can be used to extract the meaning from legal documents, is to be held in Swansea in September.

Aimed at computer scientists, the course lasts eight days and will be restricted to about 80 participants. Some places will also be available for lawyers and legal research workers who have a knowledge of computing.

The course director is Professor Bryn Niblett, of University College, Swansea, and other lecturers include Layman Allan from the US, Thomas Bernhart from West Germany, and Norman Nunn-Pric, of the UK.

Also lecturing will be Ronald Stamp, of LSE, whose legal language project represents one

of the most advanced attempts to formalise legal and other rules in machine-processable form.

Professor Niblett sees a strong possibility that developments in program semantics, such as Legal, will help in the drafting and interpretation of legislation.

At the same time, the accumulated experience embedded in sophisticated legal systems may well provide insights for the designer of computer programs.

A limited number of scholarship places will be available on the course, which is backed both by the EEC and the SRC. Further details are available from Dr P. W. Grant, Department of Computer Science, University College, Singleton Park, Swansea. Tel: 0792 22676 ext 502.

Marketing Yearbook

A REFERENCE book that should prove a key source of information for anyone concerned with marketing has been published in conjunction with the Institute of Marketing. It is the Marketing Yearbook 1979, which contains details of a wide range of companies and services which aim to get new products to the right people in the right markets.

Most aspects of marketing are covered in the extensive directories which list advertising agencies, public relations, direct mail and house-to-house deliveries, newspapers and trade and technical journals, radio and TV companies, and trade associations.

There are also sections on the work and services of the Institute of Marketing and on education and training facilities. The book consists of over 380 A4 pages and could be made a little more manageable if the list of firms and exhibitions were eliminated. It would be better to note the organisers of exhibitions and the areas they cover, or to give more prominence to Item 6 in the Sources of Information section.

Marketing people will find this a useful buy at £9.85 in soft covers, or £12.85 case-bound, including post and packing. Copies may be had from Marketing Yearbook, Diplomatic House, 12/18 High Road, London N2 9PJ.

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Basic packages

A SET of accounting packages written in Business Basic for the complete range of Data General machines is being marketed by Computerplan, of Hounslow, Middlesex. Including payroll, general purchase and sales ledger packages, the software is available both to end-users and to software houses and OEMs.

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Game, set and match

GUILDFORD and District Table Tennis Association is the unlikely-sounding guinea pig for a new computer system developed by MBS, an agent for Jacquard (now AM International) equipment.

As a local firm, MBS has produced free of charge a system which produces league tables for the 13 divisions in the Guildford league. It also ranks the 600 players. MBS is running the system on one of its own Jacquard systems.

All last year's results have been put through the system already to produce rankings for this season.

Big disc contract

THE high capacity ultra-compact line of CII-HB mid-discs designed and manufactured in France have won the company a five-year, multi-million contract in the US. Customer is Datapoint Corp, whose terminal computers are sold in the UK by Ventek. The CII-HB D100 mid-disc line includes 120, 60, 20 and 10 Megabyte drives (CW, May 3).

Major share

CLEANING up In France, Dato Maintenance of Norwood, London, has acquired an unqualified "major share" in Dilex Services of Paris. Both companies specialise in on-site disc cleaning.

Contract with

HONEYWELL has signed a long-term contract with Storage Technology Corp under which STC will supply Honeywell with its 1900 series of rack-mounted tape drives on an OEM basis.

Honeywell switch

FIVE years of better future development and settled throughput are two of the main reasons why the Bournemouth and District Water Company says it has switched from IBM System 3 to a Honeywell IBM 82 system. Main applications on the £13,000 machine will include metered and unmetered billing, share and asset registers and on integrated accounting system. Processing facilities will also be provided to the nearby West Hampshire Water Company.

Patent advice

ADVICE to employees on how to patent their inventions and make sure they do not lose their rights in them to their firm is the subject of a pamphlet published by AUEW-TASS, the technical staff union. The ramifications of the 1977 Patents Act are explained, particularly the statutory rights now given to recognised unions to negotiate compensation payments for inventions used by companies.

Switch to NCR

NOW with almost 100 retail outlets, the Homa Charn group has decided to replace its Gros mechanical registers with 150 NCR 2140 point-of-sale terminals. They will be installed at the group's Texas Homecare centres.

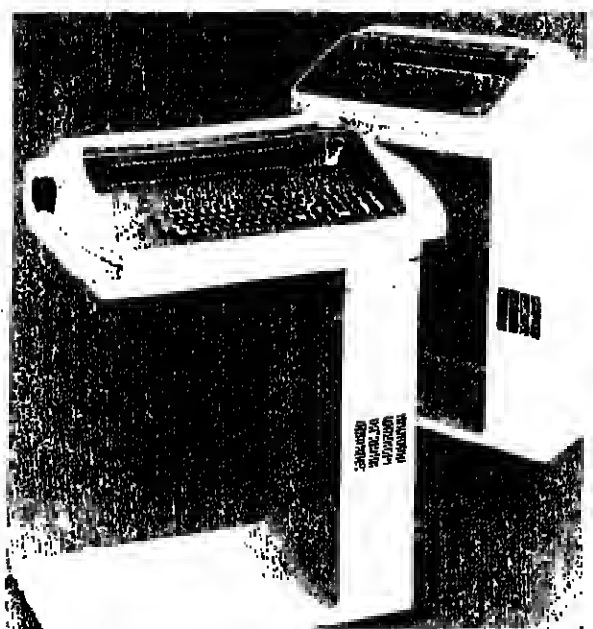
Our MBAs are able to demonstrate a working knowledge of advanced computer programming.

PRODUCT NOTES

New range of printers from Data General

A RANGE of terminal printers has been announced by Data General. They print in 180 characters per second, are logic seeking and bidirectional.

They are available in receive only and keyboard send/receive configurations.



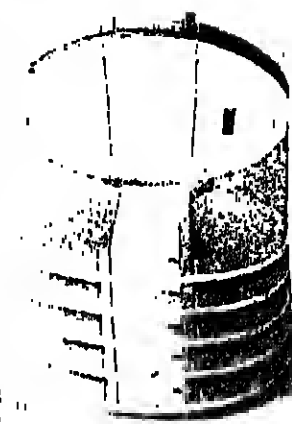
TP2 printers

Cartridge cover

SIDE and front loading cartridges can now be protected when off the drive by a security cartridge cover from Wespac. It fits over the base of front and side loading cartridges, providing a seal to keep out dust and pollution.

Storage and stacking problems are solved by the Wespac cover's positive locking, which enables cartridges to be housed safely in vertical racks or stacked horizontally. It is made from lightweight low density polythene.

The cartridge cover costs £4.00 and quantity discounts are available. Wespac (CW), 164-158 Shoreline High Street, London, E1. Tel: 01-729 1170.



Wespac cartridge cover

Miniature printer

A MINITRIM printer, which can be programmed to produce pictures, diagrams and text of any kind, has been developed by English Numbering Machines. It is the FSP40 and occupies 100 square cm of desk space.

Unfettered by vibration, the FSP40 can operate in any position, even upside down. It prints on electro-sensitive paper at rates of up to 280 characters per second. The print-out is clear and is not affected by ambient light.

A built-in microprocessor enables printing of upper and lower case characters in various styles and widths. Buffer output is applied directly.

Miniterms

THE Miniterms 1204 and 1205 portable terminals are available with removable storage media. Both microprocessor based models are alike, except that the 1205 has the addition of the built-in acoustic coupler. They both feature a built-in mini-cassette tape unit with 85,000 characters and integral 8K random access memory expandable to 32K.

Teleprinter Equipment (CW), 70-82 Akenham Street, Tring, Herts. HP23 6AJ. Tel: 0442 82 4011.

Floppy tray

FLOPPY discs can now be stored easily and inexpensively with the desk top tray introduced by Templestock. The tray can hold between 60 and 80 floppy discs without risk of damage. If required the trays can be placed in trolleys or hanging frames in cabinets. Also lockable lids can be supplied by Templestock.

Templestock (CW), 1 Ravenscourt Park, London W8 0TZ. Tel: 01-629 8553.



Xerox 8400

RANK Xerox has introduced duplicators that incorporate microprocessors. The Xerox 8400, 8400 and 8400, gives automatic double-sided copying at a rate of 7,200 copies per hour, features a fully automatic document handler and three fixed reduction ratios and a variable zoom reduction. The Xerox 8400 copies at a rate of 45 per minute, with a

bi-directional sorter, while the 8400 is designed for the low to medium copy volume user, making between 5,000 and 25,000 copies per month. All three machines have a diagnostic code system which tells the operator the reason for malfunction. Rank Xerox (UK) (CW), Bridge House, Oxford Road, Unbridge, Middlesex.

Data logger

THE Model 22008 data logger from Fluke has the ability to handle RTO inputs as well as standard thermocouple, voltage and current transmitter sources. Other features include enhanced alarm and trip facilities and a built-in 24 hour time of day clock.

Fluke International (CW), Colonial Way, Watford, Herts. Tel: Watford 40511.

Extel 951

THE Extel 951 microdisc is a minidisc recorder featuring extensive search and editing facilities. It will provide a storage capacity of over 200,000 characters on a miniature flexible disc, and offers full add, delete and replace editing on file contents and high speed searching for chosen strings of up to 15 characters. The Extel 951 is an RS 232C compatible device.

The Exchange Telegraph Company (CW), 73/75 Scrutton Street, London, EC2. Tel: 01-738 2041.

Intel kit

INTEL has announced the 8085, its 18-bit microprocessor, and at the same time the 8255, which is a complete 8085-86 microcomputer system on a single board in kit form, and is designed to enable engineers to gain experience of the hardware, architecture and machine code of the 8085. It contains all the necessary components to build a system in a few hours.

Intel Corp (UK) Ltd (CW), 4 Botolph Claydon Road, Botolph Claydon, Suffolk IP19 1JL. Tel: 0865 771431.



The Whizzard 7000

The Whizzard family

MEGATEK Corp has announced a new line of vector refresh graphic systems known as the "Whizzard", which comprises graphic peripherals, graphic terminals and stand-alone graphic processing systems.

The Whizzard 7000 series features a new improved vector generator, and another feature is the three dimensional rotation and an optional colour monitor. Four colours are standard, with an optional fifth colour available. The Whizzard 7000 incorporates all the standard features offered by the older Megatek 7000 system.

For Novice or Expert users, the Whizzard 8000 family offers refresh graphics with selective erase, translation, rotation, scaling

and zoom. The Whizzard 5000 is available as a stand-alone processor, RS 232C communicating terminal or dual board M8552 processor for installing within a customer's Novice or Expert computer. The Whizzard 5014 systems are designed easily to replace, and be upward compatible with, the Tektronix 4014 TM series of storage tube terminals.

Megatek Graphic software is a Fortran package which is designed to make the Whizzard a user oriented system.

Megatek (CW), 3931 Sorrento Valley Boulevard, San Diego, California, 92121, USA. Tel: (0101-714) 455 5590.

Twinlock storage

TWINLOCK UK has introduced a varied range of products for storing computer printouts. The range includes storage binders, filing storage units and storage trolleys.

Twinlock OP filing offers a choice of lateral or vertical suspension systems, and the Multi-Stor lateral filing cabinet allows a large filing capacity with the added benefit of security. The lockable quarter width doors protect the binders and save access space.

The cabinet is 75 inches tall and will hold five tiers of standard depth binders. Also available is the side issue cabinet, with a lockable roller shutter door, and the universal trolley, suitable for conventional suspension files.

Twinlock (UK) (CW), 38 Croydon Road, Beckenham, Kent. Tel: 01-850 4818.

HP plotter

THE latest plotter from Hewlett-Packard, the HP 7225A, is able to provide hard copy graphics from microprocessor based systems. It can provide publication quality plots by drawing clean continuous lines. The HP 7225A plots at 250 mm/s between points and will generate three characters per second for quick annotation.

Hewlett-Packard (CW), King Street Lane, Wokingham RG11 5AR. Tel: Wokingham 784774.

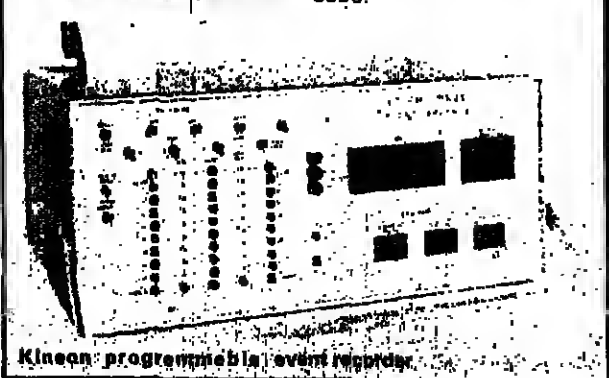
Kinson recorder

AN advanced programmable event recorder, developed by Kinson Electronics, is designed to capture event data in medical and industrial applications. It is known as the Model 4001 and contains an internal microcom-

Sockets

COMPUTER terminal sockets are now available from Kinson Electronics. They are standard wall mounting outlets for RS 232C type terminals. They comprise white rectangular plates compatible in style and fitting with MK's range of electrical outlets and boxes. One, two or four sockets are available on each plate.

Daceward (CW), The Computer Centre, Bugbrooke Road, Geyton, Hants. Tel: Billsworth 85898.



Kinson programmable event recorder

Decwriter IV from Rair

AN addition to the Rair range of Old Equipment terminals is the Decwriter IV, a 300 baud desk top terminal, which prints at speeds of up to 45 cps. Small and lightweight, it is designed for operator convenience, and one of its main features is its ability to act as firmware from the keyboard or the host computer.

The Decwriter IV costs under £900, or can be rented from around £51 per month. Rair (CW), 30-32 Neal Street, London, WC2. Tel: 01-836 1803.



The HP 3075A

FOR use in manufacturing companies, on the factory floor and in offices, Hewlett-Packard has introduced a range of three data terminals. The HP 3075A is a desktop terminal for applications such as finance, stock control and purchasing.

A well mounted version, the HP 3076A, may be fitted with a multifunction reader and printer so that it can be used for record work in progress in a machine shop. The HP 3077A, a small terminal unit, may be used for employee time reporting or to control access to restricted areas.

Options include a choice of numeric or alphanumeric keyboards and displays, and a wide

TV camera systems

GRAPHIC Display Systems of Cambridge has introduced two models, the GDS-2000A and the GDS-2000H, as additions to its GDS-2000 range of TV camera systems.

The basic GDS-2000 consists of a TV camera mounted on a head, pivot-hinged to the display. The GDS-2000A has more sophisticated means giving multi-lens, variable image magnification features with the optional use of a zoom lens.

The GDS-2000H, using broadcast quality camera, has the same mounting arrangement and a high resolution and prices are from £10. Graphic Display Systems, 1 Hamford Road, Cambridge. Tel: 0223-51643.

Rastoriser

MEGATEK's Rastoriser is a vector-to-raster converter and electrostatic printer interface that produces hard copy for the Megatek 7000 series refresh terminal in 10-15 seconds. The Megatek 7000 graphics system features refresh memory, 12 bit resolution and a 32 bit microprocessor. Optionally, the Rastoriser are select erase hardware translation, blinking and dashed line with hardware rotation, scale, clip and zoom options.

Megatek (CW), 3931 Sorrento Valley Boulevard, San Diego, California, 92121, USA. Tel: (0101-714) 455 5590.

Keyboard

A MICROPROCESSOR controlled data processing terminal for numerical control work has been announced by Control Tape Systems. It is designed specifically for use by an operator or engineer for NC tape production and editing. Features include 45 cps printer, search facility for feeds, speed and tool commands for specifying individual requirements including data transmission rates, and program outputs.

Control Tape Systems, 100, Glaziers Lane, Normandy, Surrey. Tel: Normandy 2421.

Appointments

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Programmer 12 Noobs +	COBOL/Mini	Commercial	E. London	£5500	Ref. M3329
Programmer	IBM COBOL	Commercial	S. Surrey	£5500	Ref. B3358
Programmer	IBM PL1	Commercial	City	£57500	Ref. B3358
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Contact: Andy Wright

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Contact: Margaret Stevens

For further information on any of the above vacancies, please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

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Contact: Mike Creamer

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Contact: Mike Creamer

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Closing date for applications: 23rd August 1979

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An American oil company is urgently seeking a COBOL programmer with all-round ability to work in a small development team. This could involve assignments abroad for up to 3 months (with your immediate family if desired) but is based in South Middlesex.

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ANALYSTS

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Contact: Mike Creamer or Andy Wright

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If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

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**Senior
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They have an IBM 370/138 running under DOS/VS with CICS on line enquiry and up date applications running. Recently a feasibility study has been completed for a complex on-line order processing system using DL/I and two senior system analysts are now required to join the development team. It is estimated that implementation of this system, part of a major e.d.p. development plan, will take two years.

Candidates should ideally have an industrial background and have designed and implemented at least one major system. More importantly, the positions will demand a high degree of business sense and ability to maximise the efficiency and ultimate flexibility of the system. The company have a sound reputation for good training and employ modern techniques, including audio/visual aids, for this purpose.

This represents a wonderful opportunity to apply creative ability in an interesting design project which will be a valuable career contribution.
Contact: Mike Creamer

MYRIAD**INTERNATIONAL ENERGY ENGINEERING
PROGRAMMERS/SENIOR PROGRAMMERS****NEAR LONDON BRIDGE****£6000-£7500**

Our client is an independent organisation with a worldwide operation controlled from the United Kingdom. For the last century they have been innovators in their field supplying plant to the power and process industries throughout the world. Even in the weak business climate of recent years the group has managed to substantially increase turnover and profitability with its careful investment policy. In line with this expansion the company has recently upgraded to an IBM 370/158-3. Accordingly to cope with their active development programme they are seeking the following professional staff.

PROGRAMMERS**£6000**

Applicants should have a minimum of two years' strong COBOL programming experience and whilst knowledge of IBM equipment is preferable the company runs a comprehensive training scheme for those with other machine background. Initially much of the work will involve redevelopment of financial systems and a knowledge in this area would therefore be a distinct advantage.

SENIOR PROGRAMMERS**£7500**

This is a senior position responsible for a staff of up to eight people. The successful candidate will have at least five years' IBM OS COBOL and preferably be conversant with Assembler. Since a degree of new development will be on-line, a knowledge of CICS in a financial environment will obviously be advantageous.

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SE1/0908

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Programmer****Are you interested in System 38?**

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Specific responsibilities include support of existing major software systems, fault finding and job tracing when problems arise. Minimum educational qualifications for appointment are: 3 O' Levels (including English Language) and a Scientific Mathematics A level. Candidates should normally be under 20 years of age on 1st July 1979. Salary: £2,070 p.a. (plus housing in 1980) to a maximum of £3,160 p.a. (plus housing in 1980) p.a. plus 10% at 1 August 1979. These scales will be revised in January 1980. Daily travel facilities are available from the Bedford Laboratory to most of the neighbouring towns and villages. The current and recruitment literature are provided. Staff of the Council are not Civil Servants but enjoy pay and conditions of service comparable to Civil Servants.

Application forms may be obtained from Ken Young at NEBC, Polaris House, North Star Avenue, Swindon (Tel. 0793-40101). Completed application forms should be returned by 10th August, 1979.

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You will have experience gained in a major electronics design project. You will also have experience in at least two of the following:

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PLEASE QUOTE REFERENCE NO. LP/338.

Application forms and further particulars are available from the Staff Office, Liverpool Polytechnic, Richmond House, 1 Burnfield Place, Liverpool L3 5RH. Telephone 051-227 5581 Ext. 43.

Closing date is fourteen days from the appearance of this advertisement.

THE CITY UNIVERSITY

Department of Computer Science

SRC RESEARCH STUDENTSHIP

Applications are invited for an SRC Research Studentship to investigate Braille translation. This project, in collaboration with the Royal National Institute for the Blind, aims to produce a low-cost office machine capable of accepting typewriter input, and forming Braille on a refreshable Braille display.

Candidates would normally be required to have a good Honours Degree in computer science or electronics.

Applications, together with the names of two referees, should be submitted as soon as possible to Dr. G. R. Dowling, Department of Computer Science, The City University, Northampton Square, London, EC1V 0HB, from whom further particulars may be obtained.

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APPOINTMENTS IN IRELAND

Wanted—400 more programmers a year

TWELVE months ago in Computer Weekly, in an article entitled 'Ireland Needs to Attract its Ex-patriates', I highlighted the increasing shortage of skilled computer personnel and suggested that one way to reduce the shortfall was through attracting home expatriate personnel and others from overseas, who through their skills and experience could make a significant contribution to the most dynamic and rapidly growing industry world-wide.

With the fastest growing economy in the EEC and the lowest density population, Ireland has a lot to offer to the prospective immigrant and his family in terms of personal freedom, quality of life and a relatively stress-free environment in which to bring up one's children and enjoy leisure time.

I could conservatively estimate that at least 6,000 new jobs will be generated in 1980 alone for electronic technicians and technologists in the manufacturing sector of the industry. With the growth rate now exceeding 30% in the home computer market, it is estimated that the shortfall of computer personnel at the basic level of computer programmer alone will be in excess of 400 a year for at least the next five years, which brings us to 1984.

As an indication of the level of activity currently influencing developments, the following projects are an example of the level and calibre of work and commitment on the part of the government through its agency, the Industrial Development Authority (IDA). Mostek, The Dallas-based Mostek Corp set up an advanced plant in North Dublin in July, 1978. Total capital investment is about £42 million. Plans are to manufacture silicon chips in early 1980 and the total employment should reach 1,200 by 1984.

Digital, The Digital Equipment Company is now operational in its new plant at Clonmel and employment there is expected to increase from its current level of 50 to over 500 by 1983. Employment at the Glnway plant is in excess of 1,000.

Amdahl, Amdahl will shortly move to a permanent plant in North Dublin from temporary premises, and its employment level rise from 250 by end-1979 to over 750 by 1983.

Verbatim, Verbatim Corp, a manufacturer of removable magnetic data storage media, has set up an Irish-based facility in Limerick. It manufactures such products as cassettes, data cartridges, floppy discs, mini-cassettes, magnetic cards and mini-discs. Currently employing more than 100 people, the company has plans to build a five-story complex at the Ralston industrial estate in Limerick and expand to 1,400 people in employment by 1986.

Another area in which the IDA is contributing to the growth of computing in Ireland is that of incentives to the software industry to establish business units in Ireland, particularly with an export bias. Through its Entrepreneur Scheme, the IDA has encouraged the formation of locally based businesses such as the recently formed Interactive Computing Limited, a Digital agency and PDP-11 based interactive bureau, which over the next two years will probably employ a staff of at least 20 computer professionals.

The small business systems market is now a major growth area. In 1979 alone, one manufacturer plans to install 50 systems for new users, and it is conservatively estimated that a total of over 200 systems will be installed for new users country-wide this year.

Against this background there is a recognisable opportunity for computer manufacturers and suppliers, most of which are expanding. Others new to Ireland such as Hewlett-Packard, Redifon, and the Computer Machinery Company are now establishing

organisations here to compete for this substantial business, thus creating a further demand for computer personnel.

The momentum of these events has taken some time to build up and many organisations, including governments, tend to act after the event. However, the significance and importance of these developments in terms of added value and employment to the economy is now well and truly understood by the Irish government, and through its agencies it is also making additional funds available and developing programmes to increase education levels and encourage the participation of overseas personnel.

The following are examples of some of the projects:

● The IDA has recently allocated some £2 million to the universities and technical colleges to encourage them to expand their computer education programmes.

● As part of the incentive to attract Microsoft to Ireland, the Irish government is funding a £1 million electronics laboratory, to be located within one of the universities or regional colleges of higher education.

● The recent National Manpower programme, advertised widely in the UK and entitled The Good Life, is an example of the recognition of a need to attract overseas personnel.

I understand that the government will now subsidise relocation costs for personnel offered employment in Ireland to the extent of approximately £2,000 per family.

● AnCo (the Industrial Training Centre) has recently allocated an additional £1.7 million in the funds for the purpose of increasing its training facilities for electronic and computer personnel.

Two bodies which also reflect a growing community awareness are the Irish Computer Society and the CIEEC.

Under the committed and energetic guidance of the

newly elected chairman, Owen Dalton, the Irish Computer Society is upgrading its image to relate to the needs of our expanding DP community. It acts as an interface to the EEC and is currently instigating a drive to encourage new members.

The society's education sub-committee has produced two excellent reports, entitled Crash Training Programme for Computer Programmers, and Proposal for Infra-Structure of Com-

puter Courses and Qualifications.

The Computer Industry Joint Education Committee, CIEEC, was formed in late 1978 in an effort to accelerate and influence the provision of education facilities by the government through universities, colleges and schools. It is composed of representatives of most if not all of the organisations associated with the computer industry.

The organisations are the Irish Computer Society, the

Irish Federation of Computer Users, the Confederation of Irish Industry, the National Board of Science and Technology, the Irish Computer Services Association and the Irish Business Efficiency and Trade Association.

To summarise, then, the clear message in our expatriates and overseas colleagues is that in Ireland today there are significant opportunities for career advancement in secure

employment and chances to expand your experience.

Salary and income packages are also geared to attract the professional and are conservatively estimated to be at least 20% higher than for comparable positions in the UK. This trend is evident in Figure 1, which serves to illustrate some typical income levels. Obviously these can only be taken as a guideline, as approximate mid-points in salary bands have been used.

There's still one Major Career Move you haven't thought of.



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Further particulars and application forms which must be returned by August 27th may be obtained by telephoning Whiteabbey (0231) 86131, Ext. 2243 or by writing to:

The Establishment Officer, Ulster Polytechnic, Shore Road, NEWTOWNABBEY, Co. Antrim BT37 0QB



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D.P. MANAGER To £10,000 pa + Bonus

and RPG II and/or COBOL

PROGRAMMER/ ANALYSTS To £8,000 pa

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Distribution... qualifies you for an exciting and rewarding future with a small but fast growing privately-owned company.

The top job will be taken by an experienced D.P.M. seeking a change for more challenge and responsibility or a SENIOR ANALYST/PROGRAMMER seeking his first step into management. In either case, you should have a wide commercial and D.P. background coupled with a strong desire to succeed in a management role.

First-class Programmer/Analysts with 2 to 3 years' experience of RPG II and/or COBOL, programming and some systems design experience are required to join this small but enthusiastic department to develop and implement our on-line systems.

For an immediate interview ring or write JIM FORT quoting reference CW 0308/2.

HUTTON EXECUTIVE
RECRUITMENT LTD.
HUTTON HOUSE,
HUTTON STREET,
LONDON EC4Y 8HT.
TELEPHONE: 01-552 7141
124 HOURS

Specialist Recruitment Company

Administrative Communications Officer

Applications are invited from candidates wishing to join British Rail as its Administrative Communications Officer. This is a new post, which forms part of BR's newly formed Internal Communications Services Department, and is based at London, King's Cross.

The successful candidate will be expected to oversee a number of project teams working at HQ and in the BR Regions on both conventional and more advanced studies in the administrative communications field. In particular, he or she will supervise the development of Video Word Processing applications in BR, possibly networked into BR's internal communication systems.

Candidates should be graduates with relevant development and application experience in the office automation, data processing and/or telecommunications areas. There are extensive opportunities for career advancement in any of these fields. Commencing salary will be in the range of £7,010 - £8,781 and there are generous free and reduced rate rail travel facilities. There is also a contributory pension scheme and the transfer of existing pension rights can, in most cases, be accepted.

Applications stating age, education, qualifications and experience should be addressed to:

Headquarters Staff & Services Manager,
222 Marylebone Road,
London NW1 6LJ.
Quoting ref: RB611.

INTEL 8080 Experience?

- Work on the Coast this Summer

We have several immediate and future vacancies in Sussex for people with sound Intel 8080 experience. If you have a permanent job or are available now, you will be happy to discuss the opportunities available to you.

Call Neil, Suzy or Richard
on 01-491 4708
Staff Services Division of BOC Data Solutions and Consulting Services Association

Knight Staff Services Division of BOC Data Solutions and Consulting Services Association

£210,000 P.A.

LONDON AREA

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Our Client is a well established Company backed by a major Airline with world wide interests. Their products include total information systems using mini and mainframe computers, system consultation and software. Their customers cover a wide range of companies in a variety of industries including major Industrial Organisations. The Company's applications experience is substantial, their particular strength being in the financial, management and accounting areas and through its close connection with the Airline has vast experience in the travel, Hotel and real-time reservation areas.

There is NO UPPER LIMIT and the potential is there to earn £20,000 per annum.

By selling a product that is the best, is in demand in a market that is increasingly buoyant with a Company totally committed to action not words.

You may be a Systems Analyst wishing to sell in a consultancy environment or a computer related Sales Executive wanting a career with room for advancement and high earnings based upon effort.

Ambitious - Inquisitive - flexible in attitude - a positive thinker - sociable - a good communicator. The ability to deal with people at all levels is essential.

A salary of £8,000 will be paid together with a substantial guarantee which will be paid during intensive training incorporating a visit to THE UNITED STATES.

A two litre car will be provided (or £1,500 per annum) plus other company benefits.

IF YOU WANT TO STAND OUT IN THE CROWD - GET TO THE FRONT

FOR AN IMMEDIATE AND CONFIDENTIAL INTERVIEW CONTACT SIMON LEVER ON: 01-935 0671 (24 HOUR ANSWERING SERVICE)
OR: WRITE GIVING BRIEF DETAILS.

London 01-935 0671 3 Mendeville Place, Wigmore Street, London W1M 5LB
Birmingham 021-238 3781 35-37 Great Charles Street, Queensway, Birmingham B3 3JY
Manchester 061-833 0427 Blackfriars House, The Parsonage, Manchester M3 2JA

Specialist Computer Recruitment Ltd

GREATER MANCHESTER

SENIOR SALESPERSON to £10k Basic

Small but expanding Computer Bureau based in Warrington. Subsidary of Ingo group. Need a mature and experienced person to sell Ingo services. Working on a realistic quota basis. Total earnings could be much higher. A 2 litre car will be provided. Mortgage facilities can be made available.

SYSTEMS ANALYST £6500 + Bonus

Engineering Company based close to City Centre. In process of upgrading to an IBM 370 installation. Wide variety of applications. Should have around 18 months/2 years Systems experience preferably with a background in programming. Early finish Friday.

SENIOR PROGRAMMER c £6000

Fast growing part of a multi-national group based in North Manchester. New vacancy caused by expansion. IBM 370/138 under DOS/VS. Responsible to the Project Leader for analysing, designing and documentation of programs from systems specs. Excellent opportunity for Programmer with over 3 years COBOL experience. Batch and on-line financial and commercial systems.

SYSTEMS ENGINEERS £6k to £8k

Support and development of Univac services. Should have Univac 1100 or other relevant experience, and have worked in one of the following fields: - OS 1100 Support, Compilers (COBOL, FORTRAN), Libraries, Utilities, Package Support and Development, Hardware and Terminal Facilities Planning and Implementation.

JUNIOR PROGRAMMER c £4000

Multi-national group. IBM system 3 model 15 with T.P. network. Small installation where individuals count. Programming in RPG2 for stock control, purchase order and sales statistics applications. Good chance for a young person with around 12 months experience to broaden experience and to be trained with a view to management.

To register for these and many other vacancies, please contact:

Alan Brown (Manager)
SENIOR APPOINTMENTS COMPANY
(Computer Division)

Coronation House
Arndale Centre
Market Street
Manchester
Tel. 061 832 4393

The British National Oil Corporation has within its Computer Department, a challenging opportunity for a Technical Project Leader who will lead a small team of analysts in support of the computing requirements of the Petroleum Engineering Division. This position offers real scope both for creative technical work and for management development.

The position requires an enthusiastic with 8-10 years' experience in a technical group together with a degree in engineering, computing or mathematics and preferably with further postgraduate qualifications.

You would be joining an expanding and enthusiastic Computer Department, which is involved in developing

in-house facilities based on HP 3000 and ICL 2900 equipment. As a senior member of the department you would be expected to make a significant contribution to this development. The job is based at Corporation headquarters in Glasgow but will involve frequent travel within the UK.

The remuneration package will fully reflect your own ability and the status of the post and other excellent benefits include an attractive pension, free life assurance scheme and, where appropriate, generous assistance with relocation.

For further details and an application form, contact:-



The Recruitment Officer,
The British National Oil Corporation,
150 St. Vincent Street,
GLASGOW, G2 5LJ.
Telephone Number: 041-204 2525.

The closing date for receipt of applications is 24th August 1979.

The British National Oil Corporation

PROJECT
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143/144 ROYAL EXCHANGE BUILDINGS, MANCHESTER 2

IBM 370
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for short but well-paid contracts for Scotland. Immediate start.

IBM 370
for our Midlands, North-Western and West Country clients. Various applications.

IBM 370
for our Midlands client.

For details of these and other contracts please contact
JUDY LEES/LYNN BARTON on 061-833 9341/5 (24 hrs.)

OTHER CURRENT CONTRACTS INCLUDE:

GEC 4080 Programmers with process control exp. for North ££Excellent
PDP11 Corel 66 Design/Programmers for North ££Excellent
370 OS/VS Cobol Programmers for North-West ££Excellent
CICS Systems Programmer for Midlands ££220
IDMS experienced Programmers for North-West and Midlands ££Excellent
System 3/RPG2 Programmers, interseting applications, for North-West ££220
H-P3000 Analyst, manufacturing experience, North-West £Neg
370 DOS/VS Cobol Programmers for Yorkshire ££220

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HONG KONG POLYTECHNIC

The Hong Kong Polytechnic is an expanding institution which is now putting into effect a forward-looking development plan incorporating a credit-unit approach combined with a self-learning system. The basic teaching departments are organised into three divisions — Engineering, Applied Science and Commerce & Design, and broad, inter-disciplinary centres and Institutes, Textiles & Clothing and Medical & Health Care, which are relevant to the needs of Hong Kong.

The Polytechnic invites applications for the following posts which are available from 1st September 1979

Senior Lecturer / Lecturer

Department of Computing Studies

The Department offers courses leading to the award of a diploma in Computing Studies, a Higher Diploma in Computing Studies and a Higher Diploma in Systems Analysis. The last two under a credit-unit system. More advanced work is being planned. In addition the Department serves other Departments in computing, there being currently 5,000 registered computer users in the Polytechnic.

The Department's own courses are, at present, commercially oriented. Considerable emphasis is placed on practical training, normally achieved by placing students in local companies. Over 200 interactive terminals are available on campus, with plans to increase this number to 300 by 1980/81. In addition substantial batch processing facilities are available. Successful applicants will have experience in one or more of the following areas: Advanced COBOL, Advanced Systems Analysis, Systems Programming, Real Time Systems, Project Management and Control, Data Base Management Systems, Advanced Management Information Systems, Computer Organisation and the use of Computers in Inventory Control, Production Control, Office Automation, Banking and Insurance.

General Qualification for Appointment: Senior Lecturer: (a) a degree or professional qualification, plus preferably an advanced specialisation qualification; and (b) at least five years' professional experience; and (c) substantial teaching and/or industrial/commercial experience (about 3 additional years); and (d) proven administrative ability.

Lecturer: (a) a degree or professional qualification or at least a Higher Technician qualification in the appropriate field of study; and (b) at least two years' professional or industrial/commercial experience or at least three years' teaching experience or a suitable combination of professional and teaching experience.

Salary Scales:
Senior Lecturer: HK\$1,360 to HK\$1,740 p.a. by 11 increments.
Lecturer: HK\$44,220 to HK\$79,550 p.a. by 11 increments.
Note: (1) - HK\$11,800 on 1st July, 1979.
(Continuing salary will be commensurate with qualifications and experience.)

Conditions of Service:
Appointment will be on two-year renewable contract terms initially. Thereafter suitable appointments may be offered for further periods of up to three years. Service at the discretion of the Polytechnic. Benefits include long leave, free passages, subsidised accommodation, medical and dental treatment, children's education allowance, and a loan and gratuity equal to 25% of basic salary received over the entire contract period.

Application forms and further information are obtainable from the Hong Kong Government Liaison Office, 6 Gifford Street, London W1X 2LB, UK. Completed application forms should be returned to the same office by 27th August, 1979.

Systems Analyst

c. £7,200

Having formulated a company data base we are now carrying out a user training programme so that we can develop our manufacturing and management control systems.

We need someone with analyst experience who could develop their career alongside our computerisation programme.

For further information please contact:

The Personnel Officer,
Zenith Carbuter Co. Ltd.,
Honeyput Lane,
Stammore,
Middlesex.
Tel: 01-204 3388

ZENITH
CARBUTER CO. LTD.

BRUSSELS — Telecommunications Systems Engineers and Technicians

In line with our market development we are recruiting Hardware and Software Engineers and Technicians.

We need familiarity with a broad range of telecommunications hardware and software techniques and equipment. Operational areas are communications controllers, concentrators, MODEMS, multiplexors, P.C.M. and carrier equipment; store and forward, packet switching and polling methods and disciplines. Military communications background is useful.

Salaries will be highly competitive and negotiated on experience.

We are being assisted by Charles Barker-Coulthard who are conducting initial interviews.

Please write with full details, or telephone for an application form, quoting reference 966/6 to Charles Barker-Coulthard Limited, 30 Farringdon Street, London EC4A 4EA. (01-236 0526).

prc

Planning Research Corporation International

This is your opportunity to be in at the start

Planning Research Corporation is a \$250m international consultancy enterprise with Commercial, Industrial, Governmental and Military interests. The Management Sciences Group is undertaking a major expansion programme to develop the U.K., Europe and Middle Eastern markets. The first projects are underway and we have an immediate requirement for dedicated professionals in the fields of programming, systems analysis and telecommunications. Your involvement with us at this stage of our market development will provide excellent opportunities for professional growth world-wide.

CENTRAL LONDON — IBM 370

We are setting up a major Cost Information System supporting planning and budgeting for the total construction of two new cities in the Middle East. It is based on IBM 370's on site and in London.

Programming Manager £8,500

Analyst/Programmer, 5 years' experience, IBM 370 OS/VS1 or VS2, TSO (with experience in writing/designing CLISTS). FORTRAN required, COBOL desirable. A Scientific or Engineering background and a degree are preferred with at least two years' in lead role over 5 or more programmers. Proven experience in systems analysis and design is required. You will be required to travel to the Middle East to perform the installation of the system.

Team Leaders c£6,500

Programmers/Analysts, 3 or 4 years' experience. IBM 370 with OS and VS1 or VS2 required, plus FORTRAN and Time-sharing Option experience required. COBOL is desirable. A scientific background, plus degree would be useful, but not vital. At least one year in the lead role over two or more programmers needed.

Programmers c£5,000

One or two years' programming with FORTRAN required, IBM 370 OS experience desirable.

SOUTH EAST BELGIUM — Honeywell 6000

We are converting a large Military command and control IBM 360/50 installation to Honeywell 6000.

Programmers/Analysts c£27,000

plus relocation
We are looking for two years' experience on each of TDS, IDS, and COBOL. One year's systems development and programming experience with Honeywell 6000 are expected. Applicants should be U.K. nationals.

Initial contract term is 12 to 18 months. Salary payment will be in the range of \$18 — \$20,000 p.a., plus 50% cost of living allowance. A relocation assistance payment of up to \$5,000 will be made.

GSI Systems

ARE YOU LOOKING FOR CAREER GROWTH AND A CHALLENGE?

GSI, the largest computer services company in Europe, is offering that to

CREATIVE SYSTEMS AND SOFTWARE PROFESSIONALS working in LONDON, PARIS and MUNICH

Our growing software and systems division undertakes varied and technically challenging assignments. You will be working with management so you will need eloquence, confidence and initiative. (English is mandatory). The work will include:

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PROJECT PLANNING AND MANAGEMENT
SYSTEMS SOFTWARE ARCHITECTURE
SOFTWARE PROGRAMMING

oriented to basic software, networking and sophisticated applications for mainframes, minis and micros.

Although it is unlikely that those with less than five years' experience will meet our requirements, if you think you are the exception that proves the rule, let us know. Please write, including résumé, salary history and location preference, to:

G. R. S. Bingham—GSI Systems
83 Clerkenwell Road, London, EC1R 5HP
Tel: 01-242 0747

Générale de Service Informatique (UK) Limited is an equal opportunity employer.

Computer Information Officer

Within the Computer Sciences Department, our Medical Statistics Unit is responsible for providing statistical and computing services for new and established products, primarily for clinical trials conducted world-wide. The Company has a new PRIME 400 computer on which a good selection of software packages are available and a range of statistical software including GLIM and SPSS. A good knowledge of FORTRAN is a pre-requisite.

You should be a qualified graduate in computer science with an interest in information systems, or qualified in Information Science with substantial knowledge of computing. To take major responsibility for the development and operation of a new on-line system designed to provide information about the progress of clinical trials, and be expected to make a substantial contribution to the on-going development of our patient data systems. Starting salary in the range of £4050-£4850 per annum including London Allowance. Point of entry according to qualifications and experience. There are annual bonuses totalling 10% and a non-contributory pension scheme. Assistance with relocation expenses is available in appropriate cases.

Please apply to: R. E. Nolan, Personnel Officer, Glaxo Group Research Ltd., Greenford Road, Greenford, Middlesex, quoting ref. FY274.

Glaxo Group Research Ltd.

Systems Analyst

HERTS.

Up to £8000 p.a.

With our sales team hitting all-time records, Everest is rapidly expanding to meet the growing market of house owners improving their homes by buying our double glazing products.

Efficient systems are vital in the company and our recent move to IBM System 3 model 150 has given us capacity to improve and expand our data processing operation.

The successful candidate will be a self-starter with experience which will enable them to carry through new projects on initial feasibility to final implementation as well as improving and extending existing systems in all commercial areas of the company. With the knowledge and experience gained in most departments, they will in time be ideally equipped for progression to more senior appointments in the company.

A high salary, 4 weeks' holiday, staff discount, generous pension scheme — these are some of the benefits as well as re-location help to a very attractive part of the Home Counties.



Brief personal details to: J. R. Stradwick, Personnel Manager, Everest Double Glazing, Soper Road, Cuffley, Herts. Tel. Hatfield 83635.

WHITBREAD WESSEX LIMITED COMPUTER OPERATOR

To maintain the department's operations we are seeking to appoint a COMPUTER OPERATOR for our Computer Centre in Portsmouth which provides services to Whitbread Wessex Limited based on a Honeywell 64/30 Mainframe and 718 systems, and a Ventiik Datapoint system.

The main duties of this position will include carrying out the operating requirements of four computers under the direction of a Shift Leader, the documentation of all Computer Room activities, and the production of work according to a pre-defined schedule. A two shift system Monday to Friday is involved, and some weekend working will be necessary.

The successful applicant will have at least 18 months computer operating experience, be aged 23+ and have a proven aptitude for the work.

We offer a competitive salary, generous shift allowance for a 4D hour week, and excellent fringe benefits.

Please write giving brief details of qualifications and experience to date to:

Miss C. Wilkinson
Personnel Officer
Whitbread Wessex Limited
P.O. Box 8
The Portsmouth Brewery
PORTSMOUTH PO1 3LD

Gwen college of higher education

SENIOR LECTURESHIP in Computer Studies

Salary range: Senior Lecturer — £8000 — £7700 — £6500

Applications for the above post are invited from graduates in appropriate disciplines who have experience in computing, and particularly in work with CAL and CML. The successful candidate will have an active interest in the application of computer technology to education and training. A background of "Business" in computing will be an advantage. He/she will play a leading role in the development of computing studies in the College and will be expected to teach on a variety of computer studies courses in the Faculty.

Further particulars and application forms will be sent on request to the Personnel Officer, Gwen College of Higher Education, College Road, Newport, Gwent, NP23 5TU. Telephone: Newport (0493) 421252.

Candidates may be invited to attend an interview on 11th or 12th September.

university college of swansea

Full-Time/Part-Time Programmer

(Graduate/Non-graduate)

Applications are invited for the vacancy of Full-Time/Part-Time Programmer in the Department of Computing. The successful candidate will be responsible for the development and operation of a new on-line system designed to provide information about the progress of clinical trials, and be expected to make a substantial contribution to the on-going development of our patient data systems.

The successful candidate (male/female) will probably be a graduate with a computer science degree, or statistical training to degree or HNC level seeking to gain experience in operational analysis.

Salary will be fully commensurate with the responsibilities of the post, together with fringe benefits which include a contributory pension scheme.

Applications with details of background and experience should be sent to:

Group Personnel Consultant
BLADEN & NOAKES (HOLDINGS) LTD.
16/18 Hatten Garden, London, EC1R 3PJ

DATA PROCESS SUPERVISOR

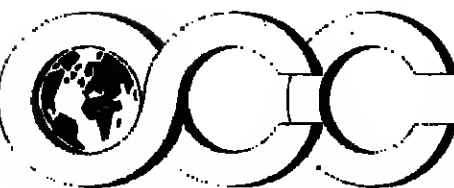
A Public Company requires for its North West London subsidiary a Data Processing Supervisor/Analyst to operate its computer systems. After a period of familiarisation it is envisaged that further work in developing programmes for the Group as a whole will be undertaken.

The successful candidate (male/female) will probably be a graduate with a computer science degree, or statistical training to degree or HNC level seeking to gain experience in operational analysis.

Salary will be fully commensurate with the responsibilities of the post, together with fringe benefits which include a contributory pension scheme.

Applications with details of background and experience should be sent to:

Group Personnel Consultant
BLADEN & NOAKES (HOLDINGS) LTD.
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Specialists since 1971 in UK and international computer appointments. We have many other vacancies in the UK and throughout the world, apart from those shown here, and offer a career counselling service to computer professionals.

Systems Controller to £7,500 - Car

- Warwickshire
- Manufacturing
- New post

This small engineering company currently uses a mini computer for a limited range of commercial accounting applications. The company, which has recently joined a substantial diversified group, now wishes to implement production planning and control systems using the hardware and technical resources of the group.

The Systems Controller will be the top DP person and will report to a Senior Manager, whilst having close working links with the Group Systems Manager.

The position requires a systems background, preferably with experience of production systems. Whilst the person appointed must be technically competent, a determined and persuasive personality is of equal importance. Relocation expenses will be paid.

To apply, please write or ring, asking for Neville John on 01-242 9355 (day) or Farnborough (Kent) 52880 (evenings and weekends), quoting Ref. 757/CW.

OCC Computer Personnel Limited
18 Bedford Row,
London, WC1R 4EB
Telephone: 01-242 9356



SOFTWARE LONDON W.1

TEAM LEADER

Up to £8750

SOFTWARE PROGRAMMER

Up to £7750

You are working in a software support or development role, but are now considering a move, perhaps to gain wider experience or to improve your earnings.

You could well be interested in joining our clients software group (near Oxford Circus) which provides technical support in a major ICL 2980 installation. The interesting features of the job are:

- Variety — Including working on operating system enhancement, performance measurements, TP and IDMS software, and providing technical support to users.
- Training in TD and IDMS where necessary.
- Potential for creative people to make a positive contribution.
- The technical challenge of advanced systems
- Sound career progression opportunities.

This opportunity will interest programmers with software experience on ANY MACHINE, using a major operating system. Our clients will provide retraining if required. Candidates for the Team Leader post should have leadership experience or capacity.

Please ring us for a confidential talk, quoting ref. CW 704 for the Team Leader post and CW800 for Software Programmer. Alternatively leave a message on our answering machine and we'll contact you.

EDP SYSTEMS 01.637 5796
52-53 Margaret St. London W1N 7FF

CAPP ASSOCIATES group provides permanent and contract recruitment services to clients and applicants

Below are just a few jobs currently available. If none of them suit your experience, contact us and tell us what you want.

With our experience, if we can't help you - WHO CAN?

DATA CONTROL SUPERVISOR	OS JCL	W.1.	£7,000	Flexitime
PRODUCTION CONTROLLER	G II/VMEB	W.4.	£6,000	DAYS
IBMSHIFT LEADER	370/DOS	CITY	£5,500 +	Benefits
IBM OPERATOR	DOS/POWER	CITY	£5,000	BANK
ICL OPERATOR	MANUAL	SURREY	£4,600	2 shift
HONEYWELL OPS	OS 2000	SOUTHALL	£4,500	2 shift
IBM OPERATOR	OS/VS1	ESSEX	£4,500	3032
JUNIOR OPS.	6 mths exp.	Various	£ Neg.	

Contact PATSY BARNES at CROYDON for further information

Positions open to male & female applicants, please telephone (24 hour service) for initial discussion or write to address below. QUOTE REF. CW105-AP

COMPUTER AND PROFESSIONAL PERSONNEL CONSULTANTS **CAPP ASSOCIATES** LONDON AND MANCHESTER **01-686 9693** A.M.P. HOUSE, DINGWALL RD. CROYDON, CROYDON



SOFTWARE PROGRAMMER KINGSTON

Due to continuing expansion within the SYSTEMS DEPARTMENT, we have a vacancy for a SOFTWARE PROGRAMMER with mini experience.

The Department currently operates an ICL 1906S - 384K, under George 3, an ICL 2980 and a range of mini-computers are used for new systems development.

The requirement is for a SOFTWARE PROGRAMMER with at least one year's experience to work on development of a network of minis, communicating with mainframes.

The successful candidate is likely to have the following:

Programming experience on a mini (high level language or assembler), preferably PDP-11 or VAX-11 under standard operating systems.

A relevant degree or professional qualification.

The ability to communicate with management, users and engineers.

This is a responsible position offering an attractive salary based on experience, and ample opportunities for career advancement. In addition the Corporation offers a Pension and Life Assurance Scheme, a Sports and Social Club (Squash, Football, Snooker, Licensed Bar etc.), excellent canteen facilities and, where appropriate, generous assistance with relocation expenses.

Please write with brief essential details, or telephone for an application form quoting CW/25 to: The Personnel Officer, BRITISH AEROSPACE, Aircraft Group, Kingston-Brough Division, Richmond Road, Kingston upon Thames, Surrey KT2 6QS. Telephone: 01-846 7741.



ELECTRONICS ENGINEER FOR SWITZERLAND

We are looking for an electronics engineer, age 24-32 years, with good experience in microprocessors and, if possible, in inter-sales service.

Knowledge of French or German would be an asset.

The after-sales service of a future electronic typewriter and word processing units requires the preparation of:

- technical documents
- technical training of field technicians
- testing units
- technical correspondence

This is an extremely varied and interesting activity collaborating with the research and development offices, the sales and after-sales network in Switzerland and abroad.

Write or telephone:

Mr. Miller
Hermès Prestige Ltd.
Boulevard de la Gare, 102 70H
(0206) 48221

PROGRAMMER/ STATISTICIAN AUDIENCE RESEARCH DEPARTMENT

£4,525-£6,225 p.a.

The BBC is looking for a PROGRAMMER/STATISTICIAN for the Statistical and Computer Systems section which is currently involved in designing, implementing and maintaining systems for the processing and statistical analysis of social survey data, using BBC's ICL 2900 and 1900 Series computers. The person appointed will assist in this work by developing computer programmes required, tackling special analysis problems which may arise and occasionally advising department's researchers on analysis of data. Applicants should have formal training in statistics, sound knowledge of PROGRAM, experience in programming ICL 2900 Series knowledge of ICL 1900 Series and PL/I are desirable.

Starting salary in accordance with qualifications and experience. Relocation expenses considered. Telephone or write immediately for application form enclosing addressed envelope and quoting reference no. 1530/C to Appointments Department BBC, London W1A 1AA. Telephone: 01-580 4168. Ext. 4619.



TELCON METALS LIMITED Manor Royal, Crawley

The Company is part of the BICC Group of Companies and manufactures high precision alloys for a wide range of industries including electrical, electronic and automotive and have a vacancy for a

DATA PROCESSING MANAGER

to take responsibility for the Small Data Processing and Systems Department using an ICL 7502 and 7503 connected to a 2980 running under OME in the north-west of England.

Responsibilities will include all development, running and maintenance of a wide range of applications together with supervision of the O & M Function.

The position will suit a person who has management experience coupled with a background in analysis and programming. Every opportunity will be given the selected applicant to extend their knowledge of management and project leadership.

Assistance towards relocation expenses will be given where appropriate. Salary £8500-£10000.

Write, with full CV to:

Mr. J. W. Ward, Personnel Manager
Telcon Metals Limited
Manor Royal, Crawley, West Sussex
Crawley 28800.

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Noble Lowndes is not just a famous name it's:

- PENSION PLAN DESIGN
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- PROFIT-SHARING SCHEMES
- MANAGEMENT INCENTIVES

Noble Lowndes and Partners Ltd.

Positions open to male & female applicants, please telephone (24 hour service) for initial discussion or write to address below. QUOTE REF. CW 165-9H

COMPUTER AND PROFESSIONAL PERSONNEL CONSULTANTS **CAPP ASSOCIATES** LONDON AND MANCHESTER **01-686 9693** A.M.P. HOUSE, DINGWALL RD. CROYDON, CROYDON

Product Marketing Executive Data Communications

Racal-Milgo Limited is a world leader in the field of data communications, and supplies a comprehensive range of sophisticated equipment to computer based users.

The Company's European sales and marketing headquarters will be shortly relocating to Fleet in Hampshire and has immediate vacancies for Product Marketing Executives.

Successful candidates will join a dynamic team of young professionals and report to the product marketing manager. Responsibility will be given for specific product areas and this will entail liaising with engineering, manufacturing and sales departments in order to ensure that technical and commercial product plans are met

from initial product specifications through to market release. Covering all aspects of marketing and high technology product line the positions are both challenging and rewarding.

A technical background in data communications systems/products is essential and some commercial experience would be advantageous.

The positions carry an attractive salary and benefits package, so if you think you have something to offer write with brief details to:

D. J. Kichenside, Personnel Officer,
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or ring Reading (0734) 595314.

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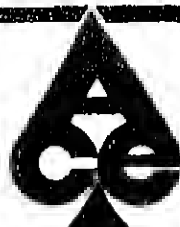
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OPERATORS — HOME COUNTIES



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3 years 370 experience using DOS/VS and a sound knowledge of a TP network are essential requirements for this responsible position. Large North London company offers excellent working conditions and benefits.

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Twin 370s running under OS/VS1 operated at the busy N.W. Kent installation. 2 years' minimum experience rewarded with good career prospects and excellent benefits.

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OPERATORS

At least 1 year SVS 3 experience required. Excellent benefits apply.

£4000-£4500

OPERATORS

With minimum 12 months George 2 or George 3 experience on 1900 or 2900 needed by this Central London client. 10% salary review under negotiation and plenty of overtime opportunities, as well as subsidised restaurant. Large installation offering good career path to the ambitious.

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SHIFT LEADER

Required with in-depth knowledge of Level 64 GCOS and good managerial abilities to handle a busy shift. Central London company offers first-class career prospects and large company benefits.

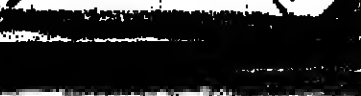
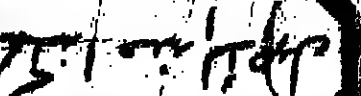
£4000-£4500

OPERATORS

To complement the above position with good knowledge of GCOS preferred. Same large company benefits apply.

These positions are typical of our current quality opportunities so if you are considering a move, whether it be on a permanent or freelance basis, please contact BRIAN POSTLES at

Accord Computer Efficiency Ltd.
Portland House
4 Great Portland Street
London W1N 5AA
Tel: 01-487 8001
01-580 37 54
Tlx: 281334 ACE UK
Licence No. 85(A)3320



EUROPEAN CONTRACTS

BELGIUM

We are currently staffing a project in Belgium for a DIS-MVS conversion.

PROJECT LEADER/DESIGNER

Commencement October 1st

Must have DOS and MVS with ASSEMBLER programming experience. Will be involved in the design and structuring of the project. Specialists only need apply.

ANALYST/PROGRAMMERS (3)

Commencement December 1st

Heavyweight professionals with PL-1 and MVS expertise. As the above contracts carry substantial rates, telephone us as soon as possible for more information.

HOLLAND AND BELGIUM

Several IMS Database Designers needed. Top rates.

GERMANY

Real time MINI ASSEMBLER Programmer needed to design and code a Stock Automation System for the car industry. Location Frankfurt.

Commencement September 15th for 6 months. Very good rate. Some German required.

For further information on these positions please contact:

Alan Whitford
Accord Computer Efficiency Ltd.
Portland House
4 Great Portland Street
London W1N 5AA
Tel: 01-637 5001
01-580 3754
Tlx: 261334 ACE UK
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CROYDON COLLEGE

Field, Croydon CR9 10X
COMPUTER STUDIES
DEPARTMENT

Applications are invited from suitably qualified persons for the following post duties to commence 1st September, 1979.

PART-TIME LECTURER IN COMPUTER- STUDIES

Part time day and evening lectures are required to teach computer programming, systems analysis and computer application. Teaching or commercial experience in computing essential.

Further details and application forms may be obtained from the Vice-Principal to whom completed forms should be returned within fourteen days of the appearance of this advertisement.

UNIVERSITY OF YORK
Department of Computer Science

ELECTRONICS TECHNICIANS GRADE 5

Applications are invited for the above post to assist staff and students in their teaching and research activities. The post principally involves designing, constructing, testing and maintaining electronic equipment in the digital systems laboratory.

Applicants should have some experience of digital electronics and an appropriate qualification. No knowledge of specific computer currency is required as training will be given. Salary on Grade 5 £3,474-£4,056 p.a. (under review).

Applications in writing giving the names and addresses of two referees, and specifying the post to which application is made, should reach the Deputy Bursar, University of York, Heslington, York YO1 5DD, by Wednesday 15 August 1979.

OVERSEAS CITY MERCHANT BANK seeks experienced IBM 34 SYSTEMS OPERATOR

Top salary for right person
Write with C.V.:
Box 1048 CW

An Opportunity in training

Honeywell Dual 66/40 installation.

Standard Telephones and Cables seeks a young ambitious computer professional to fill a vacancy for a Training Officer in its Information Systems Division.

The Information Systems Division supports an expanding communication network of terminals and mini computers with plans for significant increases in distributed systems.

The Training Officer is required to present courses on subjects including Computer Concepts, Job Control Language, Programming, Financial Modelling and Time-Sharing Operation and also to provide on-the-job training during mini-computer installation.

A solid data processing background is required combined with some experience of the preparation and presentation of training material.

A competitive salary is offered along with large company benefits, the location is the North London/Heathrow border. Please telephone or write to Mrs G. Leveille, Rel. REB7, Recruitment Department, Standard Telephones and Cables Limited, Oakleigh Road South, New Southgate, London N11 1HB. Tel 01-388 1234 Ex. 2263.

STC Changing the face of communications worldwide

International Oil Exploration and Production

PROGRAMMER

Unionoil Company of Great Britain, a subsidiary of Union Oil Company of California, wishes to engage a Programmer for the Computer Services Department at the Sunbury-on-Thames Head Office. This position, in a recently established department, offers a unique opportunity for professional challenge and scope.

Initial responsibilities include commercial programming for accounting and management information reporting systems. Candidates should have 'A' level qualifications and two to four years' experience with Cobol. Familiarity with Fortran or Basic would be an advantage.

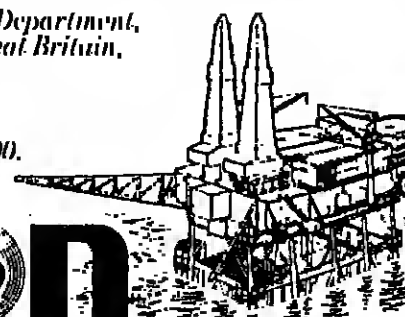
This position offers an excellent salary and benefits package and interesting career opportunities with an international oil exploration and production company.

Additional benefits of this position will be the experience gained on our in-house computer, which currently controls on-line and multiple site environment.

Interested persons should respond in writing to the address below. All responses will be held in strict confidence.

Administrative Services Department,
Unionoil Company of Great Britain,
32 Canbury Road,
Sunbury-on-Thames,
Middlesex.
Telephone: Sunbury 85600.

UNION 76



UNIVERSITY OF KENT AT CANTERBURY COMPUTING LABORATORY SHIFT LEADER

We need an experienced Computer Operator to lead a three person alternating shift operating the Laboratory's ICL 2960. Salary scale £3,818-£4,065 + £2.85 for each evening shift worked. (Under review). Application forms and further particulars may be obtained from: H. R. Clayton, Senior Assistant Registrar, The Registry, The University, Canterbury, Kent CT2 7NZ (Tel Canterbury 68822 Ext 283), quoting reference M/78/13. To whom completed applications should be returned not later than 24 August 1979.

RPG II PROGRAMMER MARLOW, BUCKS

- A new position has been created for a programmer to join a small team within an expanding D.P. Department, shortly to be relocated in new modern offices.
- Applicants should have 12-18 months experience excluding initial training.
- Current hardware is IBM System/3 Model 12 with tapes.
- May 1980—upgraded to IBM System/36.
- Applications include Order Processing, Finance, and a heavy emphasis on Marketing orientated projects.
- Attractive salary commensurate with experience.

Telephone or send C.V. to:
Miss Philippa Pearn
Maritz U.K. Limited
Marlow House, Institute Road
Marlow, Bucks (Marlow 72021)

LANCHESTER POLYTECHNIC AT COVENTRY FACULTY OF APPLIED SCIENCES Department of Statistics and Operational Research RESEARCH ASSISTANT (TENABLE FOR 1 YEAR)

THE JOB: will require the person appointed to assist with research in one or more of the following areas: Statistical Computing, Demography, Medical Statistics, Physical Geography, a newly-qualified graduate or research student, to be given the opportunity to gain experience of the Polytechnic sector of Higher Education.

For application forms and job specifications please apply in writing enclosing a self-addressed envelope to the Personnel Officer, Lanchester Polytechnic, Priory Street, Coventry, CV1 5PE, returnable by Monday, August 20, 1979.

Gold Fields of South Africa Limited

Opportunities in South Africa

Due to growth and expansion in its activities this major South African mining finance house is seeking to increase its computer staff and has vacancies at the Group's Head Office in Johannesburg for:-

*Software Programmers:

To provide system support for VME/8 and to establish and maintain a reliable software environment in GFSA. 2-4 years experience required. Salary range R610-R900 per month.

*Systems Analysts:

For the design and implementation of commercial systems project control. 5 years DP experience required with at least 1 year systems experience. Salary range R725-R1190 per month.

The Company operates an ICL 2972 computer.

Attractive employee benefits are offered, including assistance with relocation expenses. Candidates appointed will normally be expected to obtain permanent residence permits but employment on a temporary work permit basis for a minimum of 2 years may be considered.

Interviews will be held in London between 29th August and 7th September 1979 at the offices of the Group's associated company, Consolidated Gold Fields Limited. Please write, with brief relevant particulars, to:-



Personnel Manager (Ref. GFSA),
Consolidated Gold Fields Limited,
49 Moorgate,
London, EC2R 6BQ.

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You get technical challenge and total involvement with Ford's Design and Engineering

Ford is Britain's most successful vehicle design organisation, owing much of its success to a readiness to make the fullest use of new techniques. We operate one of the most advanced engineering facilities in the country and that means that we can offer real involvement and variety to computer professionals who come and join us.

Our Product Development Group at Dunton in South East Essex, houses the complete range of activities of a modern engineering research, design and development centre. You'll be working very closely with specialist engineers to develop systems for the complete range of design processes, from stress analysis of individual components to draughting, and your expertise will have a major part to play in ensuring the success of our products.

We are now looking for computer professionals in the following areas:

Vehicle/Component Test Automation

In this area you will be responsible for specifying and providing computer or microprocessor based systems for the control and monitoring of complex test rigs and providing a service for processing in vehicle test data.

Computer Aided Engineering Methods

Here you will be involved in providing advanced computer based theoretical modelling techniques for static and dynamic analysis of components, sub-assemblies or complete vehicles.

Technical Systems Services

You will be responsible for providing

mathematical services, applications software, standard utilities, operating system and hardware support.

CAD Systems

You will be responsible for providing computer based geometric data, handling systems applicable to draughting 3D mechanical design, and surface definition.

The men and women we are seeking should be educated to degree level or equivalent, in engineering or science and should have had first hand experience of one or more of the following:

- * Computer based draughting
- * Real time scientific application
- * Finite element methods
- * Vibration and fatigue analysis
- * Dynamic simulation
- * Engineering applications programming
- * Hardware and software selection
- * Data Communications

You should be able to communicate readily and effectively as part of a professional team, and to demonstrate a co-operative and practical approach to problem solving. Bringing your talents to Ford will allow development in a technically challenging environment, where promotion prospects are excellent.

We offer excellent starting salaries dependent on your experience and qualifications. Plus the fringe benefits package which includes Ford's Special Car Purchase Plan and relocation assistance where appropriate.

If you want more technical information telephone Alan Batts in our Systems Management team on Basildon (0268) 402384 or just for an application form write to Pat Adford, Room 15/166B Ford Motor Company Limited, Laindon, Basildon, Essex. Telephone Basildon (0268) 402855.



01-261 8016

Programmers - Senior Programmers, now you can afford to buy your own home!

**The Anglian Water Authority have
vacancies at excellent salaries
in a low cost housing area.**



Modern and Traditional housing is cheaper.

The Authority's Data Centre, which houses the mainframe and development staff, is in a most attractive purpose built location in Huntingdon, on the banks of the River Ouse. Recreational facilities in the area include boating and virtually all rural activities.

Housing prices really are amongst the lowest in the country. Within close reach there is a choice of old world village accommodation or modern housing developments.

The Authority offers an excellent relocation package - that 'dream house' can become a reality.

The relocation package includes:
Removal Expenses
Agents' Fees
Leave to look for accommodation
Legal Fees
Fixtures & Fittings Allowance
Temporary accommodation Allowance

The challenge of an ambitious new project.

The Anglian Water Authority is the largest of the new Regional Water Authorities. Their

territory stretches from the Humber down to the Thames.

With responsibility for administering the water resources in a territory of this size, the demand is for the very latest thinking in computer systems and communications to provide effective control and information processing throughout 20 divisional sites. The Authority's data processing is centred round large dual Honeywell Level 66/10 machines (which are due to be replaced by 66/DPS 100's shortly).

This is one of the most ambitious projects of its type at present under way in the U.K. The equipment is of the very latest specification. The challenge of providing a computer service for a newly created organisation gives opportunities to work on really interesting projects covering literally all aspects of modern commercial and technical applications.

Job Satisfaction.

The requirement is for COBOL Programmers and Senior Programmers. The systems department provides really sophisticated facilities for program development. The environment is one of professionalism, with systems developed in a controlled and logical

manner, using modern techniques including decision table preprocessors and on-line program de-bugging. As well as the current data base applications, forward planning includes a major distributed processing network based on the dual Honeywell DPS 100 system.

City salaries for country dwellers.

The Authority recognises that to attract top people you need interesting work and top salaries.

If you think that working in a rural environment means a second class income, you will be pleasantly surprised. Salaries offered are in a range up to £6,000 per annum for Programmers and up to £7,000 per annum for Senior Programmers.

We cannot emphasise too strongly the attraction of working in this environment. If you have a minimum of one years' experience in COBOL or other modern commercial languages, we would like to hear from you to discuss the positions in more detail. Please contact Michael Sands or Sara Taverner by telephoning 01-828 5356 or writing to them at the address below. Ref. 0110/CW

John Goldsmith Computer Professionals



John Goldsmith (Computer Recruitment) Ltd.,
Asphalte House, Palace Street, London S.W.1.
Telephone: 01-828 8368 - 24 hour answering service. Telex: 916779
Recruitment Consultants
A Company of the Provident Financial Group

J. H. Sankey and Son Ltd., one of the leading builders merchants in the country, with group turnover in excess of £112m, are starting work on a major long term development plan involving distributed processing throughout the UK. The early and major part of this plan is the setting up of a centre in Berkhamsted based on a PDP11/34. This will later be extended by the use of micros in branches linked with the centre.

Analyst/ Programmer

Berkhamsted c. £7000 + company car

We require an Analyst/Programmer to work as part of a small team to design and implement the new system.

The successful applicant must:

1. Be used to dealing with staff at Senior level.
2. Be self-motivated and used to working within firm budgets and time scales.
3. Have experience of RSTS and BASIC +
4. Have a working knowledge of financial and stock control systems.
5. Ideally have worked in the distributive industry.

Besides an excellent salary, we offer an attractive employment package including company car and pension scheme. There are good long term prospects for career progression within the Data Processing Division of the Sankey Group.

Applications, in confidence, giving details of background and experience should be sent to:

E. A. W. Smith, Group Personnel Director
J. H. Sankey & Son Ltd.
Head Office, Station House, Harrow Road
Wembley, Middlesex HA9 6DB

SANKEY
THE BUILDERS MERCHANT

OPPORTUNITIES IN ABERDEEN

The following vacancies have arisen at Grampian Health Board's modern computing centre in Westburn Road, Aberdeen.

SENIOR SYSTEMS DESIGNER

Salary class £6312-E7655 (plus pay award due January 1, 1980).

To take responsibility for the development of a Hospital Administration System linking to a Resource Management System (using a GEMS) and a Patient Index.

SENIOR PROGRAMMER/ANALYST

Salary class £5863-E6666 (plus pay award due January 1, 1980).

To take responsibility for the efficient running of financial and other systems, including user liaison, on an ICL 2904.

PROGRAMMER/ANALYST

Salary class £5040-E6072 (plus pay award due January 1, 1980).

To be involved in programming for the Hospital Administration on a microprocessor system, and the Patient Index System on ICL 2904.

Candidates with insufficient experience for this post may be appointed but on a lower scale.

Grampian are developing a network of communicating machines, the main ones being two ICL 2904's (programmed in COBOL) and a CTL Mod 1 (programmed in FORTRAN and using a CodeSys database management system). Links to another ICL 2904 and a microprocessor exist, and further links are being developed to Okenay and Shilland. Use is also made of the Aberdeen University's Honeywell Level 66. Further information concerning these posts may be obtained from Ken Allen, phone 0224-661816, Ext. 2677.

Application form and further details may be obtained from: The Area Personnel Officer, Grampian Health Board, 1 Albany Place, ABERDEEN, to whom completed applications should be returned by August 31, 1979.

DUNDEE COLLEGE OF TECHNOLOGY

LECTURESHIP IN COMPUTING (TWO POSTS)

The successful applicants will be capable of teaching at degree level and have specialist interests in one or more of the following areas:

computer science; systems software; computer architecture and micro-computers.

Salary: Lectureship (A) scale viz: £4422-E7812 (bar) - £8281 with initial placing depending upon approved previous experience.

Further particulars and application forms may be obtained from the Administrative Assistant (Establishment), Dundee College of Technology, Bell Street, Dundee, DD1 1HG, with whom applications should be lodged not later than September 7, 1979.

UNIVERSITY OF YORK

Department of Computer Science SRC CASE RESEARCH STUDENTSHIP

The Department is conducting research into real-time computer systems involving data acquisition, transmission and processing.

Applications are invited from candidates with a good honours degree in engineering or science who wish to research in the area of:

COMPUTER ASSISTED TECHNIQUES IN FIBRES PRODUCTION

It is proposed to investigate how a computer coupled to a closed circuit television system might be used to monitor the quality of production of synthetic fibre yarns and fabrics. This is a collaborative project with ICI, Fibres Division at Harrogate.

The successful candidate will be expected to register for a higher degree. The SRC CASE award is tenable for three years and the value in the 1978/80 year is £1820 p.a. (tax free); this will be supplemented by a grant of up to £735 p.a. (tax free) provided by ICI. The level of supplementation will be determined by the qualifications and experience of the candidate appointed. Applications from undergraduates in their final year of study will be welcome.

Further details and application forms can be obtained from:

Dr A. J. Willmott
Department of Computer Science
University of York
Healington
York YO1 5DD



London Borough of Camden

CHIEF EXECUTIVE'S DEPARTMENT

OPERATIONS CONTROLLER

Responsible to the Operations Manager for the day to day planning, organisation and control of batch processing and the provision of transaction processing facilities. Applicants will have a strong operations background with a high level of technical expertise. The successful candidate will assign and supervise operating and data control staff and Data Creation (Inforex) and operating priorities. He/she will be expected to play a major part in the conversion from a 1900 to a 2900 system.

Salary (pay award pending) £5561-E7731 p.a. inclusive. For further information ring Sam Halford, Operations Manager, on 01-276 4444 ext 2014 quoting reference number IC/55CV.

For application form please telephone our 24-hour recruitment answering service 01-637 9866 or send postcard to the Chief Executive, London Borough of Camden, Town Hall, Euston Road, London NW1 2RU, station post and appropriate reference number.

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Applicants are considered on the basis of their ability for the post regardless of sex, race and marital status. The Council also welcomes applications from disabled persons with the necessary attributes.

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One or more years' of commercial programming experience, utilizing BASIC + qualifies you for consideration by our client, an industry leader in design and implementation of financial and commercial systems.

Programs are run on their PDP 11/34 operating under RSTS-E. Other hardware and operating systems experience will be considered, the key being a desire and ability to learn.

Due to recent expansion, requirements are at all experience grades including project leader, salaries being commensurate with experience.

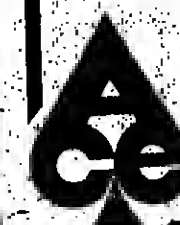
For further information contact Alan L. Whitford

Accord Computer Efficiency Limited

Portland House
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Computer Services Manager

c. £9,000

Marconi Space and Defence Systems Ltd., Europe's Number One company in the field of torpedo development, has a vacancy for a Computer Services Manager on the Sting Ray project at Stanmore.

The successful applicant will be responsible for controlling the two GEC 4082 digital computers and the Real Time Simulator currently being used to carry out scientific modelling and data analysis studies by our highly skilled teams of software programmers and engineers. The GEC 4082 computers are used in a multi-access mode and currently support a total of 32 on-line terminals and a simultaneous powerful batch stream facility.

The Computer Services Manager will control about 12 operations and maintenance staff who provide computing facilities to the project engineering teams over a two shift period. Besides controlling the existing system he/she will be expected to be involved in activities to improve the efficiency of the facility including the ability to liaise with the computer

manufacturers technical staff and to advise in extensions to the hardware.

Experience of organisation and management is desirable and it is unlikely that anyone under 28 would have sufficient experience.

This vacancy presents an ideal opportunity for a computer professional to work in our attractive setting in North West London's Green Belt. We offer a competitive salary (dependent on age and experience), a full range of fringe benefits including where necessary, relocation assistance.

Please write, with full details of your career to date and quoting reference ST/297, to Ray Leggett, Marconi Space and Defence Systems Ltd., The Grove, Warren Lane, Stanmore, Middlesex.

Marconi Space & Defence Systems (Stanmore)
A GEC Marconi Electronics Company

STAR JOB SPOT

DATA CONTROL SUPERVISOR / SENIOR CONTROLLER

To £7,000 C. LONDON
A large central London Service Bureau requires a Data Control Supervisor and Senior Data Controller, both positions requiring in-depth IIS JCL, supervisory and customer liaison experience. These senior positions must attract applicants of a high standard. If you have the right background, ring now for more details. CW 32/1 TRICIA

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A super firm with super perks including mortgage assistance, relocation expenses, subsidised canteen, plus lunch vouchers, Non-CPS, 4 weeks' holiday, free life assurance and on active S & S club wishes to recruit ICL GII and VMEB/VMEK operators with a minimum of 1 year's experience. This company uses both ICL 1900 and 2900 machines, so your working experience will be invaluable. CW 32/2 TRICIA

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Do you have 6 months' + IBM, ICL or other operating experience? Why not broaden your horizons and apply for one of our excellent junior positions in London and Home Counties area. Promotion prospects are good, and company benefits first rate. CW 32/3 TRICIA

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Join one of the most advanced computer installations in the country. The latest IBM 3000 series plus other special equipment. This major commercial business offers free BUPA, CPS and many other attractive perks including full training. CW 32/4 TRICIA

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You have only 1 year's commercial experience? Then you are in great demand. We have a large selection of first-rate companies who need people like you. Some offer mortgage assistance to the right candidates after short period with them. CW 32/5 TRICIA

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IBM AS/40/38/39/PLAN	NEW YORK 1 Yr +
IBM 360/370	KUWAIT 3 Mths
ICL 1900/2900/REALTIME	HOLLAND 3 Mths
ICL 1900/30	

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Data Processing Manager

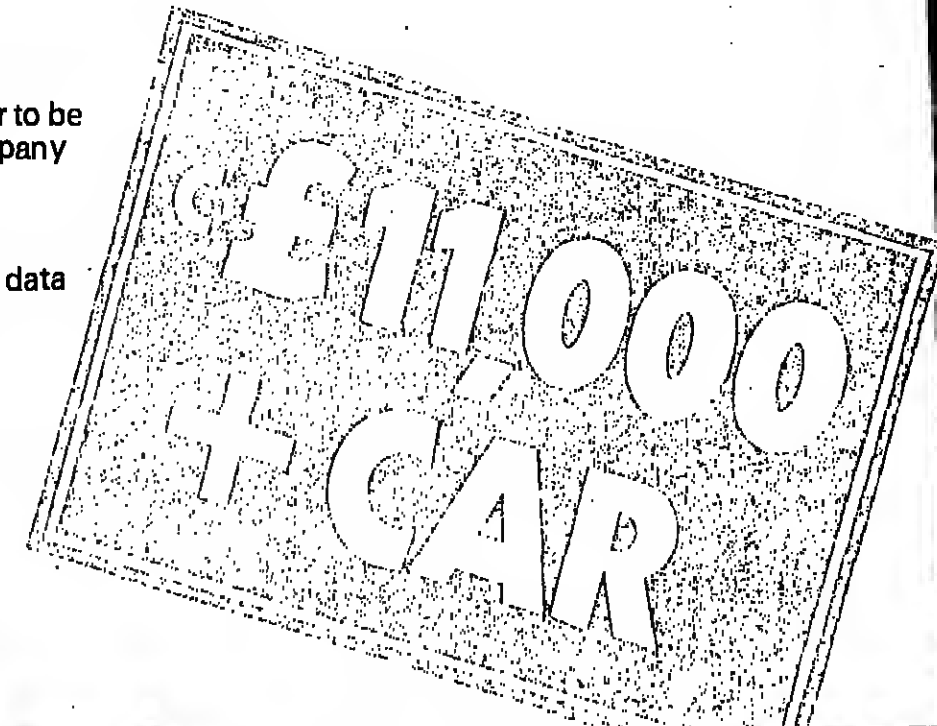
West Yorkshire...

A well-known organization requires a Data Processing Manager to be based at its head office in West Yorkshire. The Board of the company are totally committed to data processing as a key service to all operational areas of the company.

Candidates should have considerable experience in commercial data processing and be able to demonstrate a successful record of systems implementation. Previous managerial experience, preferably including responsibility for operations, is required.

The rewards will be made attractive and include a salary around £11,000 plus car, free BUPA and excellent fringe benefits. Generous relocation expenses in appropriate cases.

Please contact Ivor Norton in strict confidence, with full career details and quoting reference CW/79043.



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